SCIENCE

AEROSOL AGE

THE MAGAZINE OF PRESSURE PACKAGING

Serial Dept.
JUL 1 8 1961

How to Write Labels
[illegible] New Products
Aerosol Powders
The [illegible]
Aerosol Thermometers
Consumer Preference Survey
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APRIL 1961

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SCENTS

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THIS MONTH'S COVER

All these brands of aerosol hair spray are being packaged by Aerosol Corp. of the South, Arlington, Tenn., in purse-size glass bottles. Products above, and those in cover photo, can be refilled by inverting on a large-size aerosol container of the product. "Fashionette" is Aerosol Corp. of the South's own brand. Coated glass containers and plastic closures are by Owens-Illinois, valves by Newman-Green and VCA, Inc.

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AEROSOL AGE

The magazine of pressure packaging

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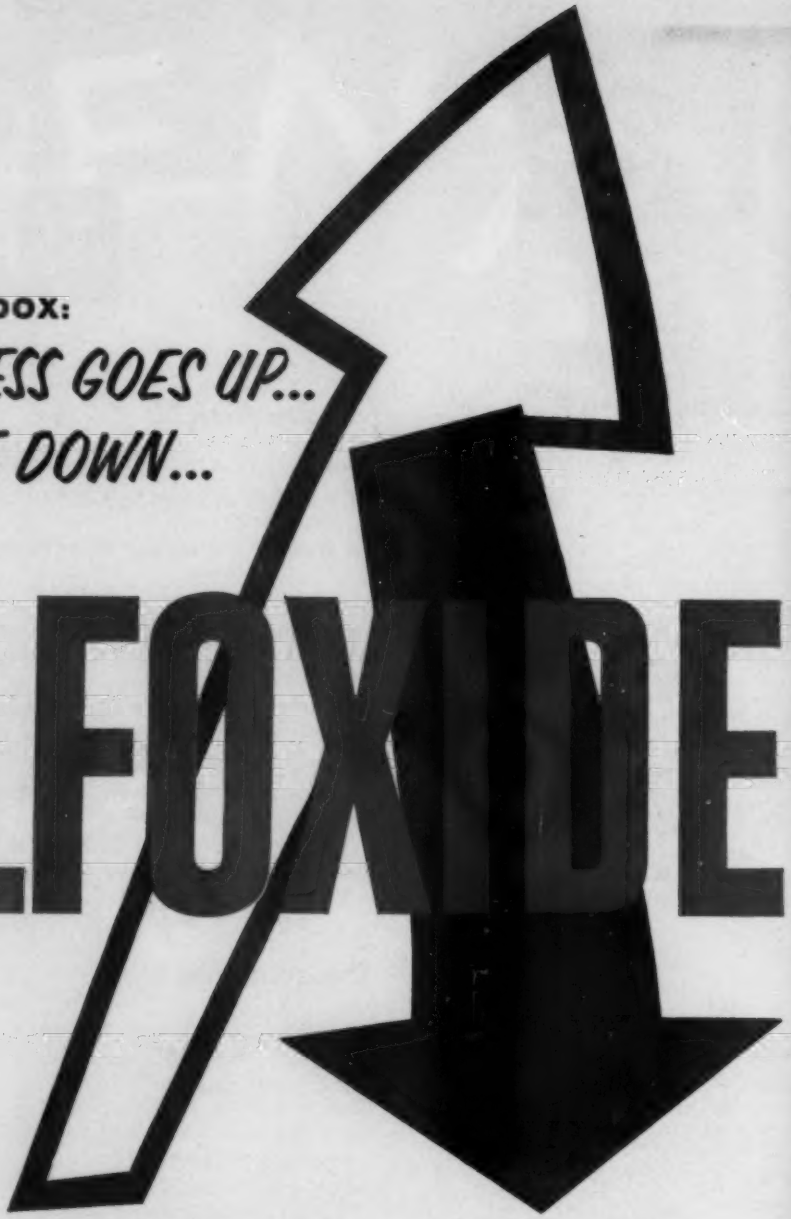

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INDUSTRY MEETING CALENDAR

National Packaging Exposition and National Packaging Conference of American Management Association, Exposition Center, Chicago.....April 10-13

American Society of Perfumers, 7th annual open symposium, Essex House, New York....April 13

Pharmaceutical Manufacturers Assn., annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. .....April 30-May 3

Institute of Food Technologists, annual meeting, Hotel Statler, New York.....May 7-11

Toilet Goods Association, annual convention, Waldorf-Astoria Hotel, New York.....May 9-11

Society of Cosmetic Chemists, semi-annual meeting, Biltmore Hotel, New York.....May 12

Chemical Specialties Manufacturers Association, 47th Mid-Year Meeting, The Drake Hotel, Chicago May 15-17

National Hardware Show, McCormick Place, Chicago.....Oct. 2-6

Chemical Specialties Manufacturers Association, Meeting of Board of Governors, Division Executive Board and Committees, Oyster Harbors Club, Osterville, Mass. .....Sept. 25-27

Society of Cosmetic Chemists, annual seminar, Barbizon Plaza Hotel, New York.....Sept. 26-27

Federation of European Aerosol Associations, 3rd International Aerosol Congress, Lucerne, Switzerland .....Oct. 3-8

Packaging Institute, 23rd Annual National Packaging Forum, Biltmore Hotel, New York....Oct. 18-20

Packaging Machinery Manufacturers Institute, Cobo Hall, Detroit, Mich. .....Nov., 7-10

Society of Cosmetic Chemists, annual meeting, Biltmore Hotel, New York .....Nov. 28

Chemical Specialties Manufacturers Association, 48th Annual Meeting, Roosevelt Hotel, New York, N. Y. .....Dec. 4-8

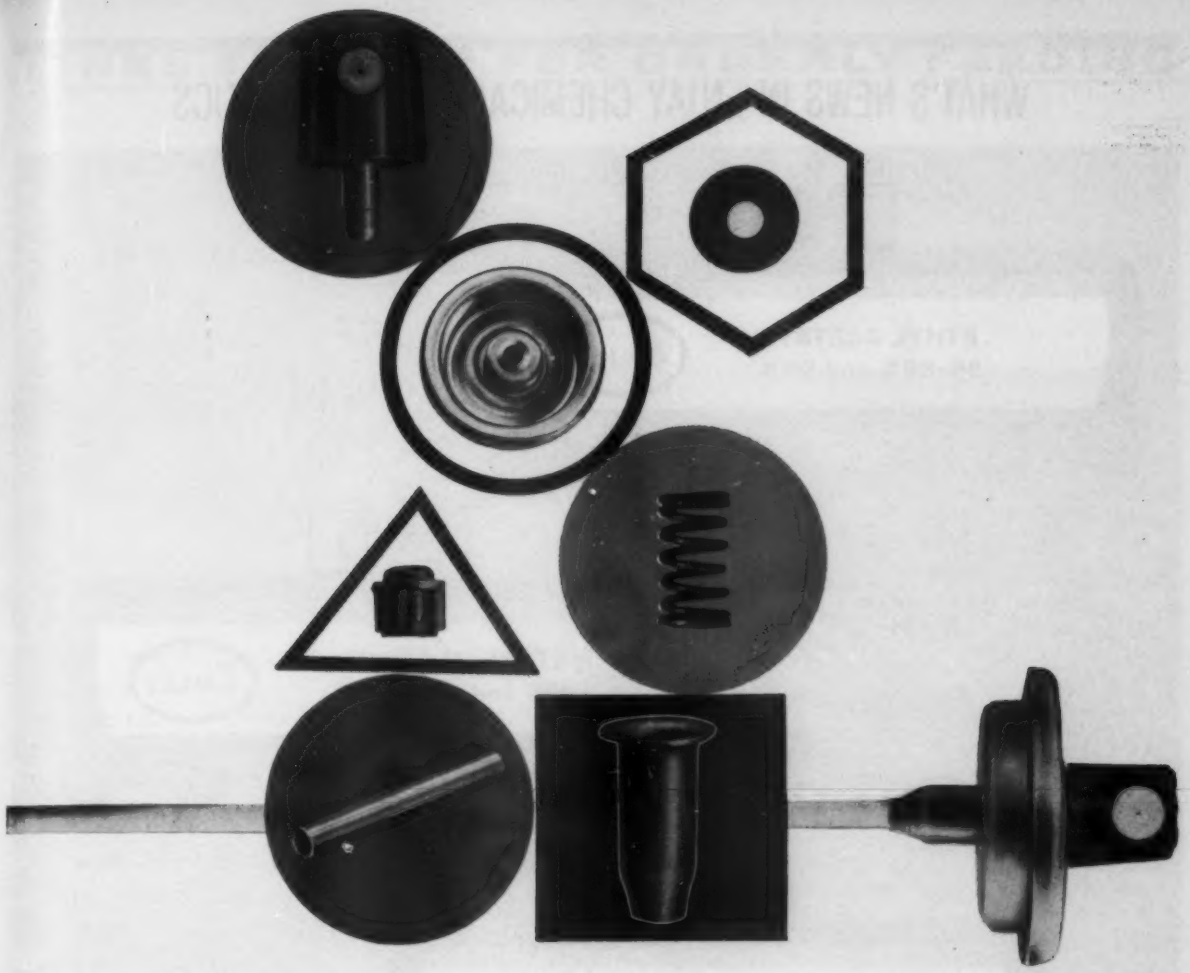
• **The Aerosol As a Pharmaceutical Dosage Form . . .** Some of the advantages of the aerosol package, and a discussion of its potential in various pharmaceutical product types, are the highlight of this article, beginning on page 22, by Theodore Dunne.

• **How to Write Labels for Compliance with the New Federal Hazardous Substances Labeling Law . . .** Concluding its three-part publication of the three highly important papers presented at the December CSMA meeting, **Aerosol Age** here features a matter-of-fact report on one major marketer's approach to writing labels. On page 28.

• **Powder Dispensing—New Potential for the Aerosol . . .** Peter Sherwood, frequent contributor to **Aerosol Age,** turns his attention this month to some practical considerations in perfecting the aerosol powder package. His article, on page 41, reports on valve clogging and other potential shortcomings of the finished package.

• **Valves by Schrader . . .** Picking up its frequently interrupted series on aerosol valve manufacturers, **Aerosol Age** (on page 25) presents a picture story on the valve manufacturing operations of A. Schrader's Son.

• **Minneapolis Survey Rates Leading Aerosol Products . . .** Consumer preference, always a touchy thing to measure, is revealed for one major Midwest city (plus the state of Minnesota) in this report of a definitive survey by the leading newspaper in Minneapolis. Hair sprays, room deodorants, shave creams, and other products are covered in this new survey, excerpts of which appear on page 20.



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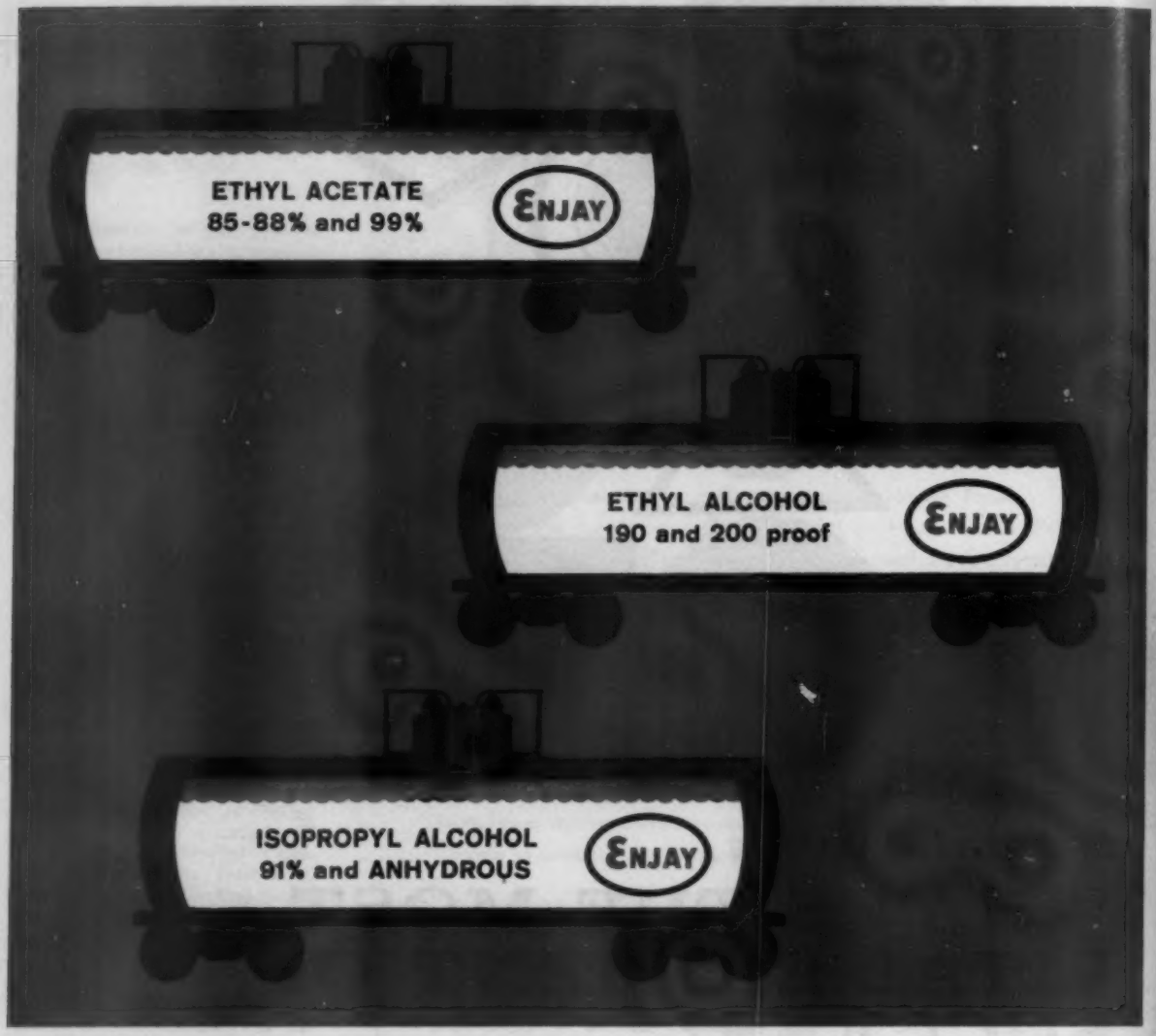

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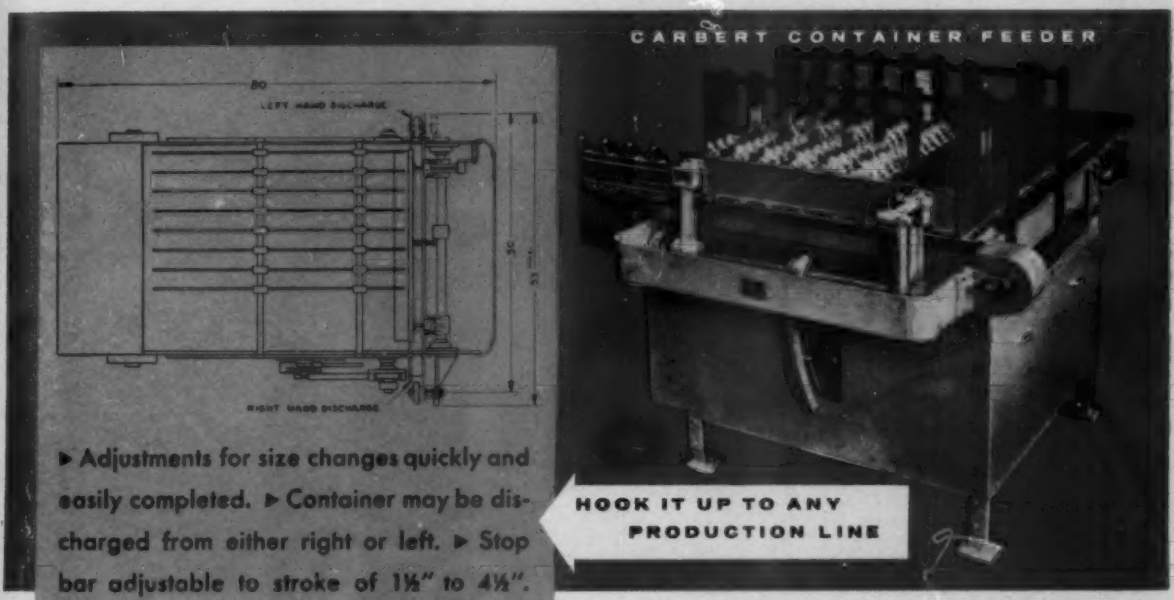

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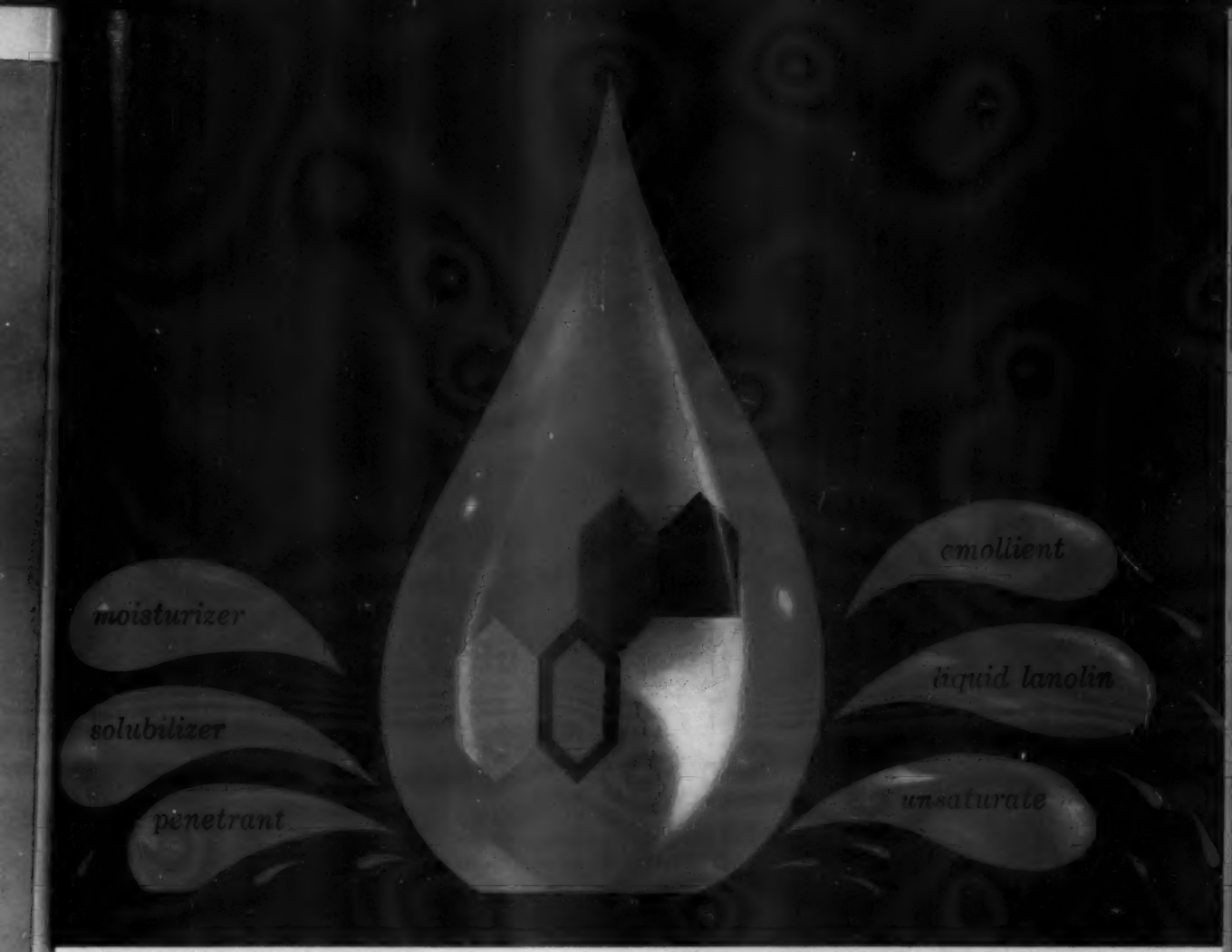

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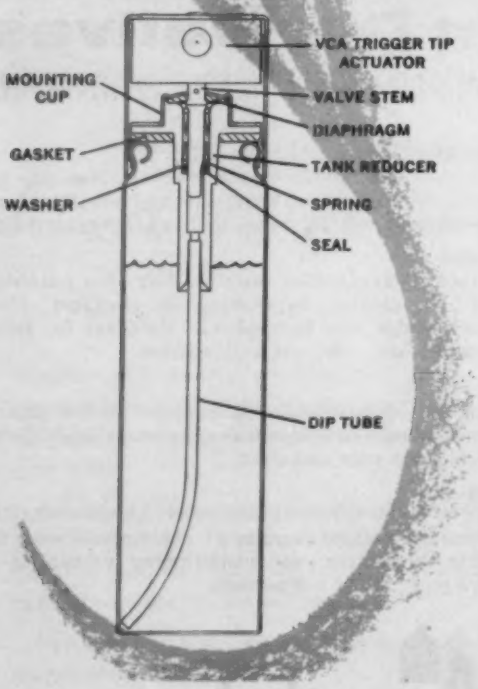

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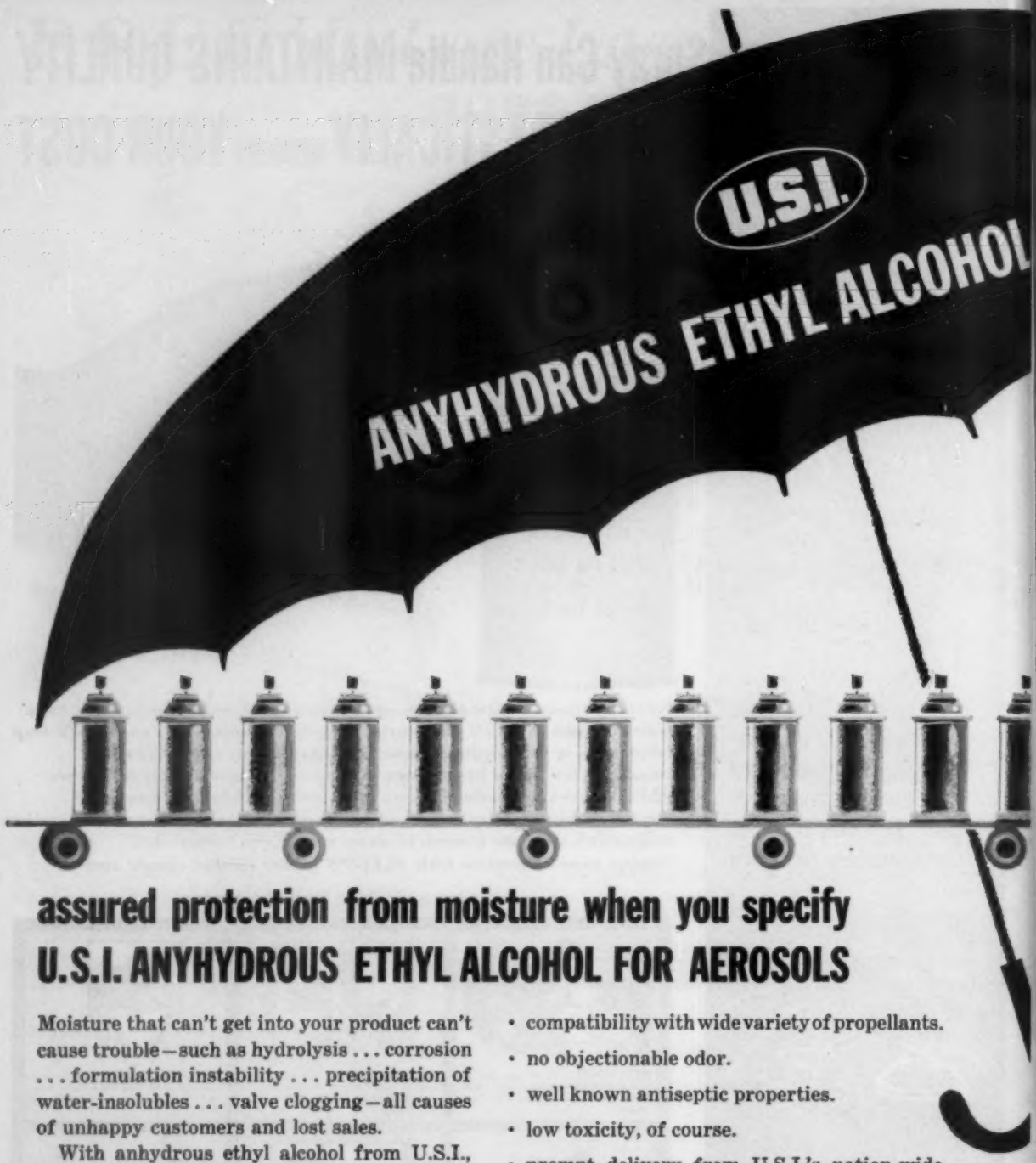

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EDITORIALS

The Search for a Winner . . .

THE spectacular success story in the aerosol industry has become so commonplace that it has generated an almost universal eagerness, among chemists within the industry, to develop a new product which will "take off"—that is, one which will capture the interest of millions of potential purchasers in a relatively short time. Each new product success adds new fire to this eagerness (which, for want of a better term, we'll call the "Gold Rush complex"), and creates additional emotional pressures to bring out that special "world beater" at the earliest opportunity.

From one standpoint, this Gold Rush complex, which also has been experienced in the aircraft, automobile, cosmetic, electronics, and many other industries, is very healthy. It generates a constant flow of new ideas, new products, and attracts new people and new companies into the field. No one can argue very convincingly against the benefits of all this.

But this bright shiny coin has two sides to it, and the other is not half so attractive. This is the side that reads something like this: "Haste, in aerosol product development, is very likely the *foremost* contributor to the mortality rate of well-conceived pressurized product ideas." Whether this haste be the product of a desire to be first in the field, or from an almost equally urgent necessity to "catch up" with the innovator, the result will probably be the same—an inferior package which will sell just once. The shoddy or the capricious in aerosol packaging—whether it be the material packaged, the components selected, or the way the aerosol is packaged—has a way of coming back to haunt the marketer with far more persistence than in other more conventional packaging types.

It seems unnecessary to restate each of the many practical precautions necessary before final market introduction of the new aerosol product. We'll skip over valve, container, and propellant selection; decision on which of the reputable custom fillers to employ (if you are not filling your own), and such oft-repeated factors as product-container compatibility, spray pattern, label design, etc. In the final analysis, all these factors eventually evolve upon product performance (whether or not it is performing the function for which it was intended) and shelf reliability (whether or not it will last a reasonable period in the home of the consumer and *still* perform this original function satisfactorily).

If the product is introduced in haste—indicating, in many cases, it was also ***developed*** in haste—the possibility always exists that the two "final" functions listed above (satisfactory shelf reliability and product performance) have not been given the amount of attention and study needed to insure success.

Relating the Gold Rush complex to one current problem, the case of aerosol starches comes immediately to mind. From what we've seen the original idea was an excellent one—the eagerness to buy on the part of the American housewife provides testimony to that. But does the market potential exist for two or three dozen brands—some of them undoubtedly not sufficiently researched in the areas of shelf reliability and product performance? We tend to doubt it.

It's still too early to tell whether so many brands might flood the market, but it is probably not too early to ascertain that the spray starch market may be flooded with *inferior* products! How many of the newer products have been shelf tested say, one year? How many have been given extensive use tests to determine whether the valve clogs, whether the product performs properly under the hot iron, etc.? These are the areas which *must* be explored in detail.★

Leading Aerosol Products Rated in Minneapolis Survey

brand leaders have trouble holding 1959 preference lead

CONSUMER market studies, always watched closely by aerosol marketers for sales trends, new competition, and other factors, are far more sophisticated these days than they used to be. Not only are the sales percentages for the various product types listed, but the latest of these, "Minnesota Homemaker Survey No. 13," even goes as far as rating the purchasers according to buying habits of the readers of the *Minneapolis Star & Tribune*, which takes the survey. And for 1960 the *Minneapolis Star & Tribune* has once more brought out its every-other-year "Mr. Minnesota No. 2," a survey of male buying habits for a wide range of products.

From the standpoint of the aerosol marketer, the main interest in the figures of these two surveys will be for three of the leading product types, room deodorants, hair sprays, and shaving creams. But also included in the survey are window and glass cleaners, auto polish, and toothpaste, all of which reveal some buying patterns for aerosol products.

On the hair spray chart, Revlon, which had led all Minnesota sales in 1959, lost ground to some of the runners-up (Avon, Breck) and finished slightly behind Helene Curtis for the first time in recent years. Avon, which had been inching forward in recent years, gained substantially, as did Breck. But the three top leaders (Helene Curtis, Revlon, and Adorn, in that order) lost a lot of ground to the smaller volume products (Lustre Creme, Lanolin Plus, Nestle, Rayette, Max Factor, Hazel Bishop, etc.).

Among the room deodorants, Colgate's Florient strengthened a slight lead it captured (among all Minnesota homemakers) last year. This was acquired at the expense of Fullmist and Air Wick, both of which dropped slightly. As it had for hair sprays, Avon moved ahead to strengthen its hold on fourth position. With the possible exception of Glade, most of the smaller-volume rooms deodorants did not substantially improve on either their position or percentage of the market.

Shaving creams, part of the "Mr. Minnesota survey," were more or less captured by Palmolive, which pushed Williams, a near competitor in 1958, into a third position. Colgate, sister brand of the leader, fell markedly in percentage and finished fourth. Gillette, a gainer, ended up fourth and Rise, another gainer, also pushed its percentage up.

Purchasers of shaving cream were asked whether theirs came in a jar, tube, or pressurized can. The latter, which has been markedly supplanting tubes and jars of late, gained another 14 percentage points over

(*Continued on Page* 90)

TOOTH PASTE

"Do you buy toothpaste?"	MINNESOTA (Entire State) All Homemakers 1960	1959	1958	1957	HENNEPIN COUNTY All Homemakers 1960	1959	1958	1957
(Yes)	93.4%	90.8%	92.6%	90.2%	94.7%	92.8%	93.7%	91.7%
BRANDS IN USE								
"What brand do you have on hand? (did you last buy?)"								
Colgate	36.3%	36.9%	40.7%	41.9%	35.8%	35.7%	38.6%	35.1%
Gleem	18.2	20.7	17.3	22.3	17.3	17.4	17.1	21.6
Pepsodent	15.0	15.3	16.3	15.7	15.2	16.7	17.9	18.1
Stripe	11.3	8.2	3.7	—	9.4	10.1	3.2	—
Crest	10.3	6.6	10.2	13.1	11.0	12.3	10.3	11.4
Ipana	7.0	7.3	12.0	7.0	8.1	9.6	13.3	10.1
Listerine	3.3	2.9	2.1	1.2	3.4	2.9	3.6	3.4
Arrid	2.1	1.6	1.1	—*	1.8	1.5	1.1	—*
Gothlin	.9	—*	—*	—	.3	—*	—*	—
Stanley	.8	—*	—*	—*	.3	—*	—*	—*
OTHERS	6.5	6.7	6.6	6.1	6.2	7.6	8.8	12.0
Don't know or brand omitted	—	.3	.3	.4	—	.3	.3	—
	103.0%	110.7%	113.3%	109.3%	108.7%	113.7%	113.3%	108.7%
TOTAL BRANDS REPORTED	28	26	41	34	19	23	26	22

—TYPE OF CONTAINER

"What type of CONTAINER is it in – tube, pressurized can, or squeeze bottle?"	All Homemakers 1960	1959	1958	HENNEPIN COUNTY All Homemakers 1960	1959	1958
Tube	92.0%	92.3%	94.6%	93.3%	93.6%	93.9%
Pressurized can	4.0	4.5	2.2	4.0	4.2	3.6
Squeeze bottle	1.0	2.7	4.2	1.7	2.5	2.4
Other answers	1.7	—	.7	.9	—	1.1
	102.7%	101.4%	101.7%	101.9%	100.3%	102.0%

AEROSOL PRODUCTS

HAIR DARE PREPARATION —IN PRESSURIZED CAN

"Do you buy any hair care preparation in a pressurized can?"	MINNESOTA (Entire State) Star and Tribune Readers 1960	All Homemakers 1960	1959	1958	1955	HENNEPIN COUNTY Star and Tribune Readers 1960	All Homemakers 1960	1959	1958	1955
(Yes)	36.8%	35.2%	28.8%	32.9%	18.2%	38.3%	38.3%	32.8%	33.6%	19.2%
BRANDS IN USE										
"What brand do you have on hand?"										
Helene Curtis	17.8%	17.7%	20.4%	20.9%	32.7%	17.7%	17.6%	13.7%	23.9%	36.0%
Revlon	16.2	17.6	26.7	20.0	7.3	19.1	19.1	25.9	30.8	14.6
Adorn	15.5	15.4	13.7	17.1	—	13.2	13.5	13.8	10.4	—
Avon	10.3	9.1	5.6	5.5	7.1	9.1	8.7	3.6	1.5	3.4
Breck	7.9	8.3	5.3	2.5	—*	10.9	10.9	8.6	3.5	—*
Lustre Creme	4.2	3.5	—	—	—	4.1	3.9	—	—	—
Lanolin Plus	3.3	2.6	—*	—*	—	.2	3.0	—*	—*	—
Nestle Spray	2.1	1.8	—*	2.4	—*	1.4	1.3	—*	—	—*
Fayette	1.7	1.4	1.1	—*	—*	1.8	2.6	.5	—*	—*
Max Factor	2.1	1.4	.9	.9	—	1.4	1.3	1.5	2.0	—
Hazel Bishop	1.9	1.3	.7	2.6	—	.9	.9	2.5	2.5	—
Style	1.4	1.3	1.3	—*	—	2.3	2.2	4.1	—	—
Helena Rubenstein	1.7	1.2	1.2	1.6	1.8	1.8	1.7	2.5	3.0	4.3
Stanley	1.2	1.2	2.0	1.3	—	.4	.4	.5	.5	—
Tempo	—**	.6	—*	—	—	—**	2.2	—*	—	—
OTHERS	18.1	16.0	21.6	16.5	32.7	17.3	15.6	19.8	14.4	21.5
Don't know or brand omitted	2.1	1.8	2.1	4.5	.5	2.7	2.6	2.5	2.0	1.7
	107.5%	102.2%	102.3%	103.8%	101.9%	107.3%	106.9%	101.5%	102.5%	101.3%
TOTAL BRANDS REPORTED		34	47	43	20		15	35	27	22

SHAVING CREAM

(Asked of all men using EITHER SAFETY OR STRAIGHT-EDGE RAZORS:)		MINNESOTA (Entire State) Star and Tribune Readers 1960	All Men 1960	1958	HENNEPIN COUNTY Star and Tribune Readers 1960	All Men 1960	1958
(Percent using shaving cream)		51.9%	52.2%	38.8%	54.0%	54.7%	38.3%
BRANDS IN USE							
"What brand of shaving cream are you now using?"	Palmolive	19.7%	18.7%	14.3%	16.8%	16.5%	16.6%
	Mennen	9.7	9.5	8.5	8.1	7.9	10.4
	Williams	7.8	6.3	14.4	6.8	6.7	10.4
	Colgate	7.4	5.9	10.6	6.8	7.0	9.3
	Gillette	6.8	7.8	4.8	7.2	7.0	3.9
	Rise	6.4	6.0	4.7	9.0	9.1	7.0
	Burma Shave	6.3	6.5	7.3	9.7	9.5	10.1
	Rapid Shave	4.7	5.3	3.7	4.7	4.6	3.1
	Aero Shave	4.3	3.7	4.7	4.4	4.3	5.3
	Old Spice	3.5	4.0	2.9	4.4	4.3	4.2
	Noxzema	1.6	2.0	1.9	1.2	1.2	2.2
	Barbasol	1.1	1.0	.9	1.9	1.8	1.7
	Arva	1.0	1.4	1.2	.6	.6	1.1
	Watkins	.4	1.0	.9	—	—	—
	Brisall	—**	1.6	—*	—**	1.5	—*
	OTHERS	20.2	21.4	18.5	19.0	18.6	16.9
	Don't know or brand omitted	1.5	1.4	2.6	1.9	1.8	1.7
		102.4%	103.5%	101.9%	102.9%	102.4%	103.9%
TOTAL BRANDS REPORTED			35	42		26	27

ROOM DEODORANTS

"Do you use room deodorants?"	MINNESOTA (Entire State) Star and Tribune Readers 1960	All Homemakers 1960	1959	1958	HENNEPIN COUNTY Star and Tribune Readers 1960	All Homemakers 1960	1959	1958
(Yes)	68.1%	63.7%	62.8%	64.6%	67.6%	66.7%	58.1%	62.0%
BRANDS IN USE								
"What brand do you have on hand? (did you last buy?)"								
Flotient	22.6%	23.6%	18.5%	21.3%	22.3%	22.0%	19.0%	20.7%
Fullmist	15.1	16.0	18.2	13.9	14.8	14.0	23.5	21.8
Right Kick	12.3	12.7	11.6	14.0	10.6	11.0	11.2	12.6
Air Kick	10.7	10.1	14.9	15.1	12.4	12.0	15.2	16.1
Arva	9.9	9.3	7.1	2.4	10.4	10.3	7.5	5.4
Stanley	6.5	7.4	8.0	8.2	3.1	3.5	4.6	4.0
Glade	7.5	6.6	5.0	3.0	9.3	9.2	7.2	4.9
Watkins	3.7	3.5	4.3	3.9	3.1	3.2	.8	2.7
Sprayaway	2.5	1.8	1.0	—*	3.1	3.1	.6	—
Randolph	—**	1.4	—*	1.4	—**	1.2	—*	1.6
Pine Sol	.8	.6	.8	.9	1.6	1.5	1.4	1.1
OTHERS	10.0	7.6	9.0	11.4	10.6	9.2	7.7	10.5
Don't know or brand omitted	1.8	1.8	5.1	2.5	2.6	2.5	4.9	5.1
	103.5%	102.7%	104.6%	103.5%	103.9%	103.7%	103.7%	103.5%
TOTAL BRANDS REPORTED		60	43	38		39	28	35

BRUSHLESS SHAVING CREAM—CONTAINER

(Asked of users of BRUSH-LESS SHAVING CREAM:)		MINNESOTA (Entire State) Star and Tribune Readers 1960	All Men 1960	1958	HENNEPIN COUNTY Star and Tribune Readers 1960	All Men 1960	1958
"Does your shaving cream come in a jar, a tube, or in a pressurized can?"	Pressurized can	79.4%	80.9%	66.1%	81.2%	80.5%	62.6%
	Tube	17.8	14.4	24.9	14.8	15.6	28.4
	Jar	5.4	5.4	9.0	4.9	4.9	10.5
		102.6%	100.7%	100.0%	100.9%	101.0%	101.5%

Among all MINNESOTA men who use:	Regular readers of the Star and/or Tribune—daily, Sunday or both—account for:	Among all HENNEPIN COUNTY men who use:	Regular readers of the Star and/or Tribune—daily, Sunday or both—account for:
pressurized can	66.1%	pressurized can	99.4%
tube	80.7		

BY PLACE OF RESIDENCE (Entire State)	CITIES	TOWN-FARM
Pressurized can	80.3%	81.2%
Tube	14.2	14.5
Jar	5.9	4.3
	100.4%	100.0%

(* – Listed under OTHERS in survey indicated) (** – Listed under OTHERS in Star and Tribune readers column)
NOTE: Percentages over 100 mean that some respondents gave more than one answer.

AUTO POLISH

"Do you ever buy auto polish for your car (or for any car in the house hold?" (Asked of all car owners.)	MINNESOTA (Entire State) All Men 1960	1958	HENNEPIN COUNTY All Men 1960	1958
(Percent of car owners buying auto polish)	54.4%	43.0%	61.9%	42.8%
BRANDS IN USE				
Johnson	36.5%	30.5%	35.1%	43.6%
Simoniz	16.0	21.3	19.2	18.5
Turtle Wax	14.8	20.0	16.7	17.7
Vista	8.5	3.0	10.4	4.1
DuPont	8.5	6.0	10.7	8.1
Prestone	2.4	—	5.6	—
Stanley	1.5	—*	.8	—*
Blue Coral	1.1	1.1	3.1	1.4
Wax-It	1.0	1.0	—	.6
Phillips	.9	—	1.5	—
Holiday	.5	—	1.8	—
Soapy	.9	—*	1.2	—*
OTHERS	11.5	13.7	11.9	12.5
Don't know or brand omitted	3.2	5.2	3.7	8.1
	106.1%	107.1%	106.2%	109.2%
TOTAL BRANDS REPORTED	63	60	42	36

WINDOW OR GLASS CLEANER

"Do you buy any kind of window or glass-cleaning preparation?"	MINNESOTA (Entire State) All Homemakers 1960	1959	1958	1957	HENNEPIN COUNTY All Homemakers 1960	1959	1958	1957
(Yes)	74.6%	70.8%	71.9%	70.8%	79.8%	74.8%	70.7%	71.3%
BRANDS IN USE								
"What brand do you have on hand? (did you last buy?)"								
Windex	40.2%	42.3%	40.6%	36.4%	36.3%	36.9%	33.9%	32.0%
Glass Wax	13.2	10.4	17.4	19.4	11.1	12.7	18.2	20.3
Sprayplate	7.3	7.7	5.4	7.3	9.8	9.9	8.5	6.1
Bon Ami	7.0	5.2	10.0	11.2	7.7	6.2	10.4	11.7
Potomac Ammonia	5.3	5.0	8.0	6.1	9.2	6.7	10.9	13.6
Jet Bon Ami	4.4	5.2	—	—	5.6	7.4	—	—
Easy Off	5.1	—*	—	—	2.9	—*	—	—
Ammonia (no brand)	3.5	3.7	6.6	3.5	4.4	6.3	6.2	5.9
Stanley	2.9	2.3	3.0	4.0	1.5	1.1	2.4	1.5
Fuller	1.4	1.4	1.4	1.0	.8	1.1	.5	.7
Sprayaway	1.5	—	—	—	2.1	—	—	—
Vinegar (no brand)	.8	2.1	2.2	2.1	1.9	2.2	2.8	2.4
OTHERS	13.3	12.2	11.0	11.2	9.6	13.3	10.7	11.9
Don't know or brand omitted	1.1	.3	.4	1.0	1.5	.6	.7	.9
	110.4%	105.6%	107.1%	105.1%	104.4%	104.4%	109.2%	105.6%
TOTAL BRANDS REPORTED	66	66	55	68	42	42	39	44

AEROSOLS as a pharmaceutical dosage form

*By Theodore F. Dunne**
General Chemical Division
Allied Chemical Corp.
Edgewater, N. J.

THE self-contained, pressurized dispensing unit which we recognize as the modern aerosol package has provided the pharmaceutical industry with a truly unique and highly versatile dosage form. The aerosol pharmaceutical is unique because *no other* single dosage form can match all the advantages it provides for both the drug manufacturer and the consumer. It is versatile because it has already found important application as topical, intranasal, and intravaginal medication, and as systemic medication via the inhalation route. It has also been used in the oral cavity as a topical dental anesthetic. It is not unrealistic to believe that in the near future aerosol products will be used to apply ophthalmic, ear and rectal medication.

The advantages of aerosol pharmaceuticals make their first contributions during product development. A primary concern in planning a new drug formulation is the stability of the active ingredients that are to be incorporated. Among the chief causes of chemical instability and consequent loss of potency is reaction with one or more of the components of the air — oxygen, carbon dioxide, or moisture. Instability to light is another factor that must be considered.

An aerosol package eliminates these common causes of instability, for it is either evacuated or flushed of air by propellant vapors during the filling process. Thereafter, the positive internal pressure of the permanently sealed aerosol prevents reentry of air during storage and use. Permanent protection from light can easily be assured by use of a metal container or an opaque plastic-coated bottle.

Instability of ingredients is not the only factor that can contribute to change of potency in a drug product. Volatility of the active ingredients or vehicles can play a significant role in potency change. Because an aerosol unit is, in effect, permanently stoppered, evaporation of product components *cannot* occur. Thus, another real problem common to conventional dosage forms does not exist for the aerosol drug.

THE permanent seal of an aerosol package not only assures greater stability and extended use-life, but it is also responsible for an additional plus value. With non-aerosol packages it is possible to furnish the patient with a sterile product, whether that product be packaged in a bottle, collapsible tube or other type of temporarily sealed package. The very first time the cap is removed or the seal broken, however, it is almost certain that sterility will be lost unless the product is protected by an efficient antiseptic preservative. What is more, preservatives can fail under some conditions. Even multiple-dose vials containing parenteral products can be protected against contamination only if aseptic precautions are observed. The aerosol package now makes it possible to package a drug product, without incorporation of antiseptic preservatives, and have it remain uncontaminated despite repeated daily use by even a very careless patient, for the positive internal pressure prevents entrance of viable organisms just as it prevents reentry of air. Another significant value of the aerosol dosage form thus becomes obvious—a medicinal product which maintains its sterility will not contribute to secondary infection nor introduce infection where none exists.

Insofar as infection is concerned, the aerosol drug surpasses, in still another aspect, the non-areosol dosage form of topical medication. The spray-type liquid or powder aerosol can be applied to the affected area directly from the container without the aid of fingers, swabs, spatulas, tongue-depressors or other applicators which are very apt to be contaminated. Again the areosol eliminates the possibility of introducing secondary infection, in this case via an applicator. Perhaps equally important is the fact that because the medication need not be spread over an affected area after application, there is less chance of autointoxication or spreading of infectious organisms already present. The same situation holds true for non-infectious derma-

* Presented Nov. 17 at the "Symposium on Aerosols" held at the School of Pharmacy, Rutgers University, Newark, N. J., to mark the opening of the school's aerosol research laboratory.

(Abbott photo)

titis such as poison ivy whose toxin is readily spread by rubbing of the contaminated area.

There is another point of interest which should be mentioned regarding application of topical medication by aerosol spray. If an area of skin requires treatment, it must have been damaged—by pathologic process, irritant or other cause. If the skin has been damaged it is very likely to be abnormally sensitive. The soft, cooling spray of the aerosol is entirely free of traumatic effect, and does not require the touching of the area in any way in order to distribute the medication.

Aerosol therapy enjoys other advantages that deserve mention.

By means of metering valves the dose of medication dispensed by an aerosol can be controlled with considerable precision. The metered dose is important in inhalation, intranasal, and intravaginal therapy and will undoubtedly play an important role in ophthalmic, ear, and rectal therapy when and if aerosol products are developed for such purpose. The accuracy of the dose is totally independent of the patient's judgment, education, or intelligence, except that he must be able to count how many times he depresses the actuator button.

Uniform coverage of the affected area is accomplished with a minimum of product. Wasteful heavy or thick layers of lotion or ointment are avoided. Waste of medication left on applicator as residue is also eliminated.

Apparently, aerosol application of a drug can *enhance* its therapeutic value. This is indicated by the reports of two separate clinical groups who have found that prednisolone, when applied in an aerosol formulation, relieves the itching of dermatologic conditions more efficiently than ointments or creams. One of the groups commented that the distinct cooling produced by the propellant enhances the anti-itching effect of prednisolone. (These reports appear in the A.M.A. *Archives of Dermatology 79:* 103, 1959).

Children are notoriously uncooperative when medication must be applied to painful areas. The speedy, painless application made possible by the aerosol cannot fail to win a warm welcome from the harassed parent.

The hazard of accidental poisoning of children by medicines in the home is well-recognized. A child can swallow lethal amounts of even a foul tasting or strongly caustic material before he is aware of its distasteful and painful character. The many children who suffer lye burns of the mouth and esophagus each year are evidence of the truth of this statement. The aerosol drug is delivered relatively slowly, and if a child sprays the drug into his mouth he very likely will be repelled by the taste before he ingests dangerous quantities.

Topical aerosol medications are ideally adapted to use in veterinary medicine. Cats and dogs, for instance, are very apt to resist attempts to apply a topical medication. The speedy application made posible by the aerosol can simplify the problem to a large degree. Then, too, an aerosol spray more readily penetrates past the hairy coat and to the skin than ointments, creams or solutions.

To conclude the discussion of advantages we should mention that the aerosol pharmaceutical, like all aerosol products, provides ease and convenience of use, and an attractive, non-spill, durable package unit.

The first aerosol pharmaceuticals to be developed were designed for topical medication, and aerosol drugs in this category still far outnumber any other type. There are topical aerosol medications for a variety of indications, and the range of products will surely continue to expand. Any medication intended for external use is a candidate for aerosol packaging. Not all drugs will be found amenable to aerosol packaging, but it is reasonable to expect that the successes will exceed the failures. The list of aerosol topical medications is too lengthy to deal with here, but just a few product types can be mentioned to give an insight into the variety available. There are: athlete's foot remedies, burn treatments, poison-ivy remedies, steroid preparations, coal tar extracts, anesthetics, analgesics, spray-

(*Continued on Page* 87)

Schering's three "Diloderm" packages

The Role of the Marketer in developing pharmaceutical aerosols

*By John Graham**
Schering Corp.
Bloomfield, N. J.

PHARMACEUTICALS are the baby of the aerosol industry; we have all seen their great growth potential. Though they may never attain the volume of insecticides or hair sprays, they should provide a comfortable income to fillers, valve manufacturers, and container manufacturers.

We in the pharmaceutical industry have many of the problems of the other manufacturers and in addition, the conservative methods of advertising and packaging and the rigid controls of the Food and Drug Administration. We have to submit data to the Food and Drug on stability, shelf life, effectiveness and side effects of the preparation, also spray rate and delivery. Discussing these separately, I would like to point out that we must furnish data from our laboratories that both the active ingredients and the inert materials are stable for a period of time, also, that leakage of propellant is low enough that less than 10% is lost over a stated period of time. If the material is stable for two years or 10% propellant is lost in two years, our label must contain a two year expiration date. Because of the distribution system in depth that pharmaceutical concerns use, prescriptions containing a two year outdating could be uneconomical to produce. Therefore, we look for a minimum of three-year shelf life.

The Food and Drug Administration must be furnished with the results of the testing of clinical material by specialists in this field throughout the country. Both effectiveness and any side effects reported by independent doctors must be recorded.

We must express in terms of percentage of material sprayed per two or three seconds of valve activation and in the case of metered valves, the exact amount of material delivered on each application. This can not vary by more than ± 10%.

We do not advertise in magazines, newspapers, or on radio or television, but advertise in medical journals and to doctors either by direct mailings or personal contact by our representatives. Clinical investigations are reported as publications in medical journals.

For prescription items, we cannot use lithographed containers, but must have paper labels with directions to the customer attached so that the pharmacist can easily remove the label copy and affix the prescription label. Our company entered the aerosol field principally for the same reason many other industries have accepted aerosols; ease of application, economy and controlled dosage forms. *When the aerosol is used as a gimmick, it will not sell. This has been proven by many items that have reached the market.*

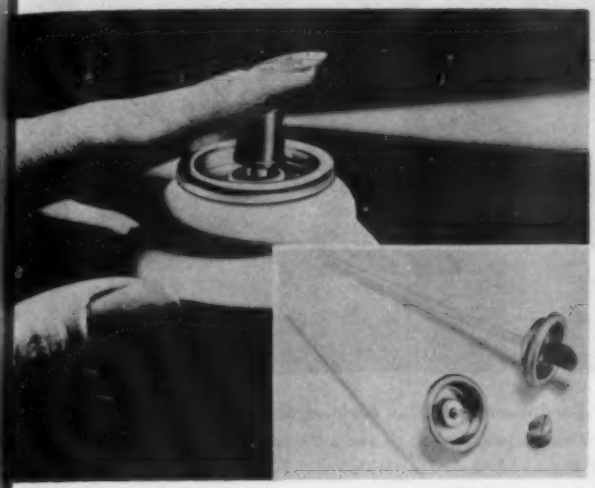
IN June, 1958, we introduced "Meti-Derm Aerosol" and it was well received by the medical profession. Advantages over our cream preparations can be easily seen. When we first started development work on this product, we used the .018 inch body opening which delivered 1½ gm./second of material. Our 150-gram container was then emptied in 100 seconds. The patient would receive approximately three times as much medication as was necessary. This aerosol was not eco-

(*Continued on Page 85*)

* Presented to the midyear meeting of the Chemical Specialties Manufacturing Association on May 17, 1960, at Chicago, Ill.

1. Roy Ferry (r.) chief engineer for aerosol products, and Richard Mellegren discuss modification of basic valve. 2. Standard Schrader valve, showing slanted actuator. 3. Steele Elmi (foreground) chief chemist, checks valve modification for performance and chemical compatibility. 4. Rigid control over materials is evidenced in this blending of synthetic elastomers and other components in a Bambury mixer.

1.



2.

VALVES By Schrader

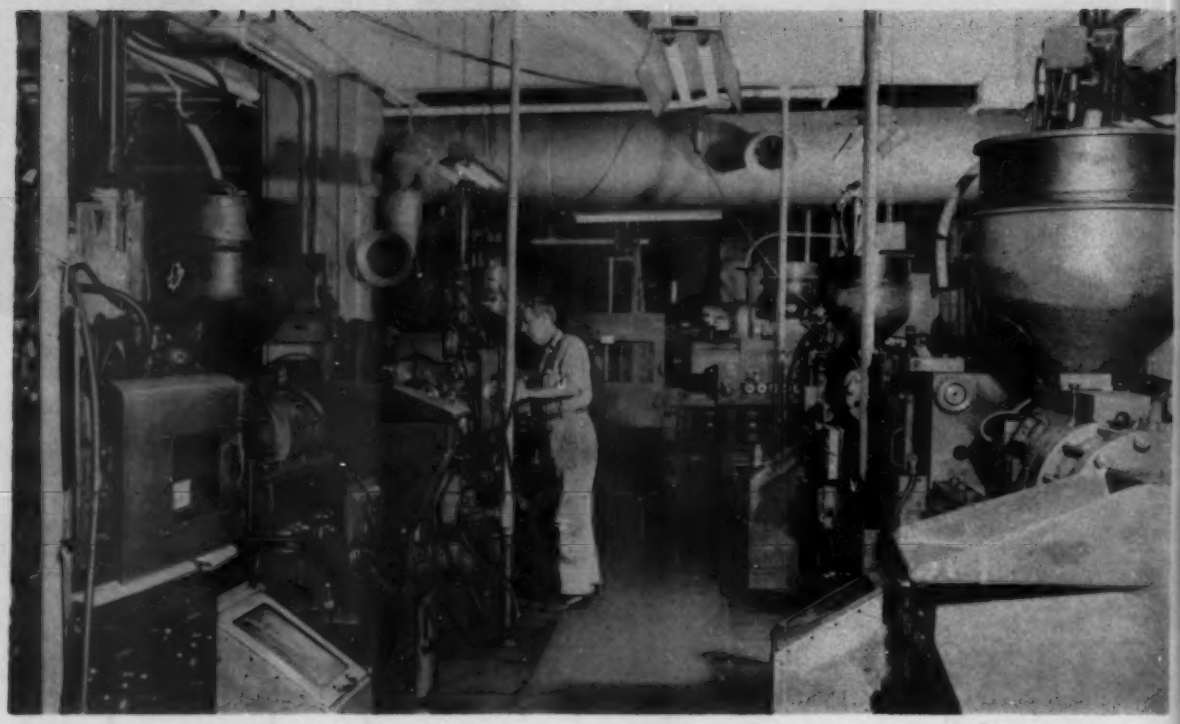
3.

"tailoring the valve to fit the product."

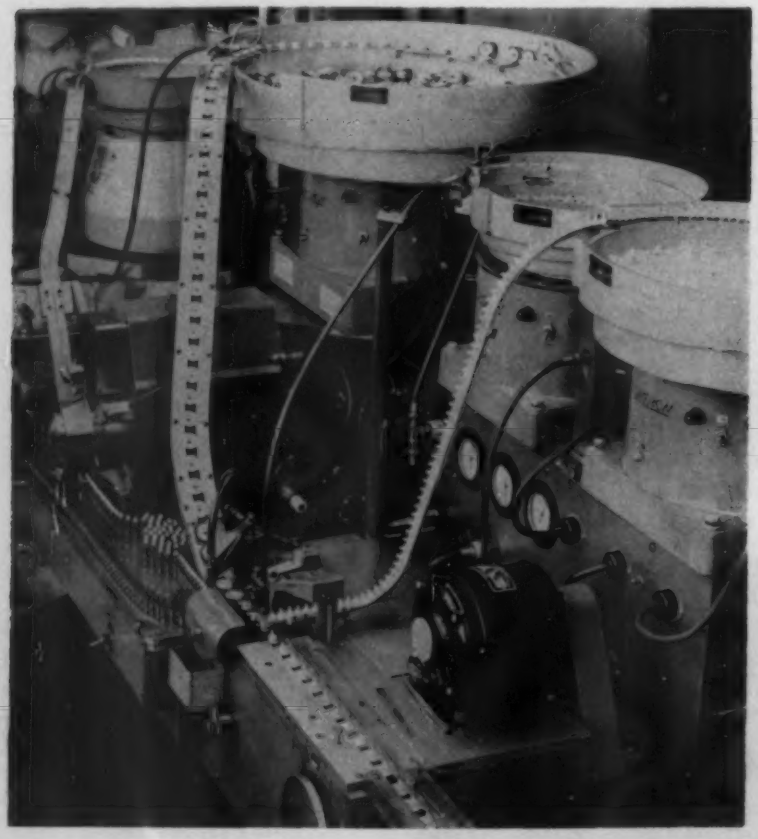
THE future in aerosols well may lie in valves which will be custom designed and manufactured *for specific products*—rather than having products tailored for a "standard" valve type. This is the aerosol philosophy currently being pursued by A. Schrader's Son Division of Scovill Manufacturing Co., Brooklyn, New York, which has succeeded in strengthening its position in the highly competitive valve market despite a relatively late entry into full-scale competition.

Evidence of the success of this philosophy was a recent shipment by Schrader of a large order of valves, specifically modified to handle a new aerosol cosmetic product. This is the first of what the company manage-

4.



Above: Valve stems, spring cups, and buttons are injection molded in three-and-six ounce Fellows machines in Schrader's plastics molding department. All molds are designed, and the majority made, by Schrader technicians. Below: Valve parts are hopper-fed into position, assembled and automatically air tested for leakage. Defective valves are rejected and good ones transferred to button and dip tube assembly.

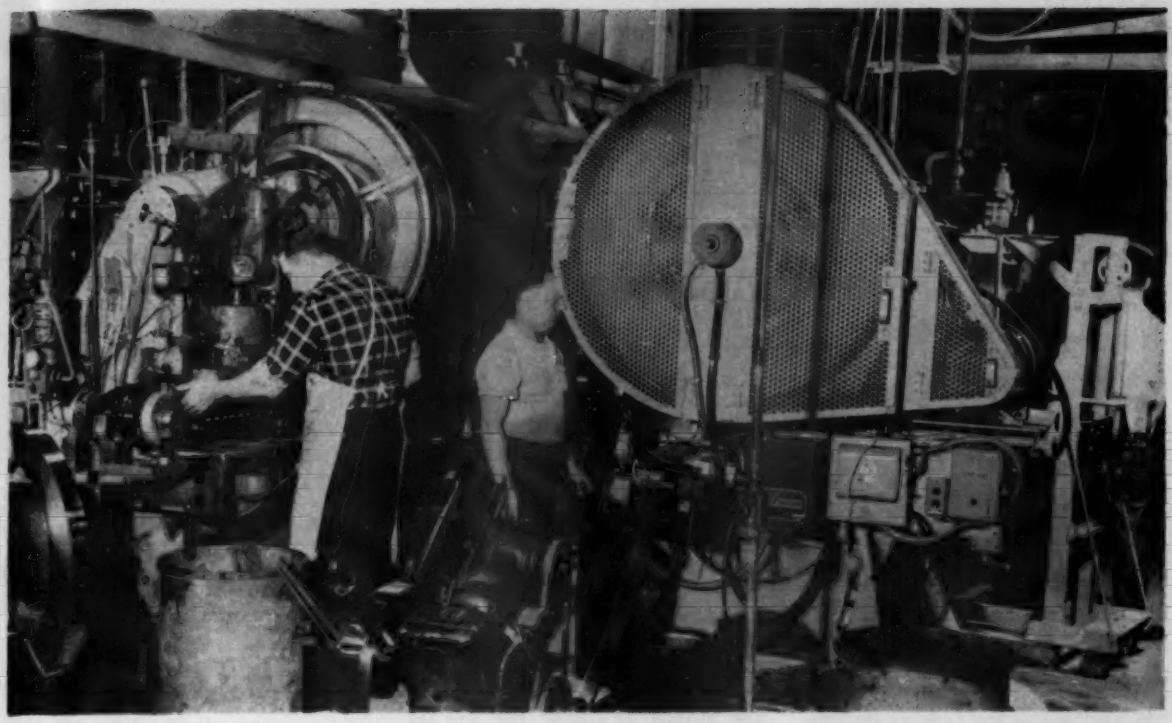


ment believes will be a large number of variations to come from its basic "toggle-action" valve.

Schrader is banking heavily on this "toggle-action" valve, which the company points out will be able to handle a wide range of product viscosities with very light finger pressure and without the possibility of mis-directed spray. Custom modification of the valve to handle individual product needs, it is pointed out, is a logical step to full realization of the capabilities of the design.

Schrader, a pioneer in tire valves and a world leader in air control equipment, has set up a separate plastics department for aerosol valve components and has staffed an aerosol laboratory for development work.

To insure a high degree of quality control at every stage of production, the company manufactures every component of the valve (except the dip tubing) and even designs and builds much of its production and testing equipment. Advanced quality

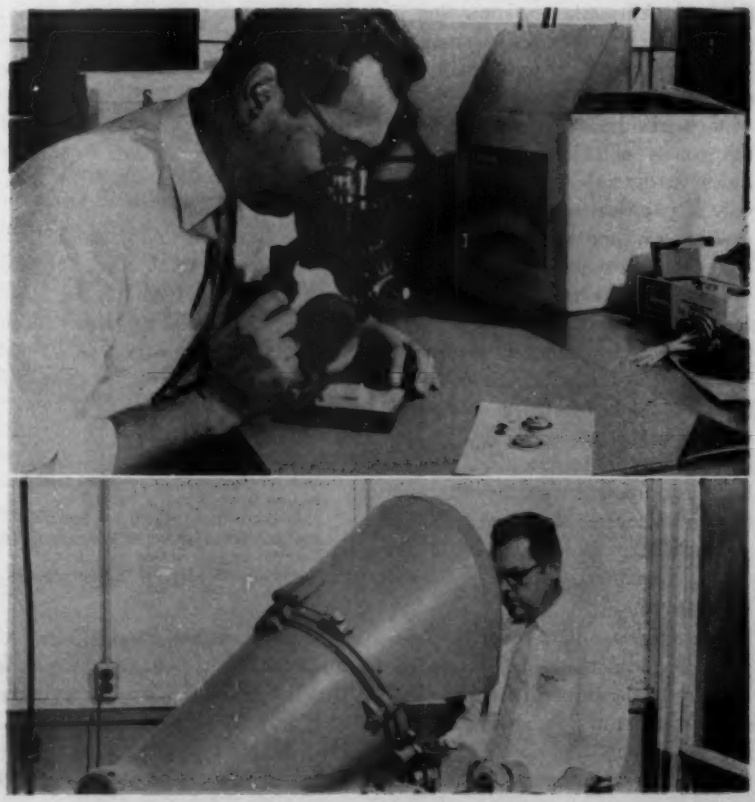


Above: Schrader claims to be the only valve producer making its own caps to insure quality control and production scheduling. Stock is bought in wide rolls, slit to 2⅛"-wide strips, and stamped in 40-ton progressive punch and die machines. Below: valves which do not pass air pressure test are analyzed to determine cause of leakage. Statistical quality control is maintained by use of optical comparator.

control, however, extends to far more than inspection and testing of finished components and assembled units. From the formulation and production of special rubber compounds to the design of molds for plastic parts, Schrader relies on its long experience and highly developed skills acquired in making tire valves.

Rigorous tests and special equipment have been devised to insure controlled quality of the new valve components. A personnel development recruiting program was launched to recruit experienced aerosol specialists. Many new production techniques, solely for aerosol, were developed, others were successfully transferred from its tire valve production skills to aerosol valves. Among the latter are techniques to closely control the physical properties of rubber compounds (hardness, resistance to compression set, surface smoothness, size, uniformity, and adequate service life), and tech-

(*Continued on Page* 80)



HOW TO WRITE LABELS UNDER THE HAZARDOUS SUBSTANCES LABELING ACT

*By George T. Scriba**
Union Carbide Corp.
New York, N. Y.

THE MOST important thing to be said about the Federal Hazardous Substances Labeling Act is that it is *not new law*, either for a company lawyer, for company executives or for company people responsible for marketing and labeling household products. All marketers know that if one of their products injures someone they are likely to face a claim for damages and perhaps a lawsuit. All of them also know that in most cases the courts will hold the marketer liable to the injured person if and only if you were negligent. And it is well known, too, that it is negligence and it has been negligence as a rule of common law for many years to fail to put on your label a clear warning of any substantial hazard which the marketer, as a reasonable man, should have known about and should have foreseen. The courts have become stricter and stricter in their requirement that the marketer know and foresee the hazards of his products (that is why I think I can omit the technical subject of breach of warranty).

The marketer of household products has faced the penalties of civil liability to the injured person before the enactment of this new statute. He still faces them. And now all he faces that is new are new and additional penalties. These are criminal penalties and include, of course, fine and imprisonment and seizure of products. But there is no new concept of liability in this law; only *new penalties*. All that the new statute does is to say that in a case where the marketer was formerly liable for damages, he is now also liable to fine and imprisonment, and his products are subject to seizure. There it is, in one sentence, and I think it is substantially true. The qualifications I would have to add if I were writing for a law review are minor.

Now I am not simply speaking for myself here. I think I am speaking for the Senate of the United States. The Senate Committee which recommended this bill to the whole Senate for enactment said this in their written report on the bill:

> "The standards established in this bill for determining whether a substance is or is not a hazardous substance are those which are generally recognized as common law in civil liability cases relating to the seller's duty to warn users of the hazards of his products."

What does this mean to you as a marketer? If I am right, it means that if you are now labeling a product in a way which protects you against civil liability, you are already labeling it in substantial compliance with the new statute. It means that if your product is not hazardous enough to require a warning label to protect you against civil liability, it is not subject to this statute.

The more detailed provisions of the statute are of four sorts:

Provisions which in my opinion limit the statute to chemical specialties, and exclude from it such hazardous things as knives, electrical appliances, mechanical devices, etc. (and also exclude foods, drugs and cosmetics; pesticides; and fuels since their labeling is governed by other statutes).

Provisions which, within the limits of the common law rule, give the Food and Drug Administration the duty and the power to make that rule more definite and certain by determining and saying whether a particular chemical specialty or class of chemical specialties is hazardous, and if so, what warning is necessary and adequate for its label;

One or two provisions which draw specific lines between hazardous and

---

* Presented at the 47th annual meeting of the Chemical Specialties Manufacturers Assn. in Hollywood, Fla. on Dec. 5, 1960.

non-hazardous substances. For example, the provision which draws a specific line for a substance which is hazardous because it is flammable, which says that flammable substances with a flashpoint below a certain figure may be hazardous and, if so, must bear warnings, and that those with a flashpoint above that figure are not; and

Provisions which suggest and formalize and standardize to some degree what a warning must contain subject to FDA's power and duty to require and permit more or less in order to make the warning fit the hazard of a particular product.

IT WILL be noticed that the regulations which the Food and Drug Administration is in the process of drafting are going to be along the same lines — regulations which will indicate products and classes of products FDA finds are hazardous substances and regulations which will suggest warnings FDA finds adequate, for particular products and classes of products.

I was glad to get the impression that FDA will be slow to try to write broad, general regulations. The objective of the statute is to see that products that ought to carry warnings carry them, and that in each such case the warning fits the hazard of the product. The hazard varies in many cases with the individual product. It is difficult to write general rules which, even if they apply to most products, will not be subject to numerous exceptions.

I know many of you marketers would like a series of specific clean-cut rules to follow, so that labels could be written to conform with them and let the marketer know once and for all that his products comply with the statute. It is not that easy. If such general rules were provided, I think there would immediately be unforeseen exceptions. While the general rules may sound as if they made sense and will make sense for most products, nevertheless they will require no warnings on products where there is a known hazard, where the marketer must warn to protect himself against civil liability and where he wants his competitors to have to warn also; and that they will require warnings on products which he knows are not hazardous and where common sense says no warning is needed.

Nothing could be simpler or sound sounder, for example, than to say that if vapors from Chemical X kill so many animals at such a concentration, then any chemical specialty containing Y% or more of Chemical X must bear a warning that the vapors are harmful or fatal. But suppose your product containing Y% of Chemical X is a solid. Or suppose you package it like a lighter fluid. And there is, in fact, no hazard. Or suppose your competitor's product (yours is perfectly safe) contains *less* than Y% of Chemical X, but is to be heated when used, so that the vapor comes off in a greater concentration and is hazardous, although the rule says it need not bear a warning?

Writing general rules which try to take into account and weigh all of the built-in safety factors and all of the built-in hazards of all of the chemical specialties on the market is, I think pretty obviously, beyond the ability of any of us.

But writing a specific warning for a specific product on a common sense, reasonable basis on the basis of what your reaction would be if you were an intelligent and reasonable juryman in a civil liability suit is relatively easy. You may want to, and probably should, have your doctor and your lawyer double check what you write. You may, in the case of a new product, even want to ask the FDA toxicologists for their informal advice on hazards which, if precedent holds, they will be glad to give you, although as law enforcement officials they cannot commit themselves legally or allow you to quote them publicly. But basically all you need is knowledge of the hazard and lack of hazard of your products.

The responsibility of writing one's own label is not a new one. For years the marketer has faced civil liability if he did not meet this responsibility. All he faces now are the new penalties. He must not expect—and I don't think he wants—the government to tell him exactly how to label his products, either product by product, or through an attempt to write an all-inclusive code of general rules and regulations.

I THINK what we can hope for are, first, a few and, over the future years, an increasing number of guideposts in the form of specific regulations by FDA on specific products, when packaged in specific containers. And I think we can also hope for broader regulations which will be more in the nature of statements of FDA policy rather than hard and fast rules; and which will expressly recognize that known and unknown exceptions exist in both directions, hazardous exceptions and non-hazardous exceptions.

I turn now to a few specific products, packaged in specific containers, and to the practical side of deciding whether a product is hazardous and, if so, the technique of writing a warning for the label.

First, it will be well to put before you again in summary form what the statute has to say about writing a warning label.

Statutory Requirements

1. *Your name and address.*
2. *Names of Hazardous Ingredients*
3. *Signal Word.*
4. *Statement of Hazard*
5. *Precautionary Measures.***
6. *First Aid Instructions.****
7. *The word "POISON".*****
8. *Storage instructions.*
9. *Special Requirement.*

Examples

John Doe Company
Johnstown, Ohio

---

* On products which are extremely flammable, corrosive, or highly toxic.

** Unless Food and Drug Administration regulation says not necessary.

*** "When necessary or appropriate." Generally used to date only on "highly toxic" products (poisons) and on products which may cause eye injury.

**** On products which are "highly toxic". Defined in the law. Perhaps also on other products which experience has shown are highly hazardous, for example, methanol, carbon tetrachloride. I think FDA has the power to say that the word POISON is needed to make the warning fit the hazard.

Methanol
Carbon Tetrachloride
Danger! *
Warning!
Caution!
Harmful if swallowed.
May cause eye injury.
Flammable.
Do not take internally.
Keep away from sparks and flame.
Do not breathe vapors.
If swallowed make patient vomit.
Call a physician.
POISON
Do not store near heat.
Keep out of reach of children.

I have heard many discussions of the relative impact of the alternative *Signal Words* — "Danger," "Warning" and "Caution." Almost everyone agrees that "Danger" is stronger than the others. The new law requires it on highly hazardous products, as indicated by the footnote above, but I think it may certainly be used on less hazardous products if the marketer feels it is needed. Some people think "Warning" is stronger than "Caution." This law makes no distinction between these two.

The Statement of the Hazard is the "guts" of the warning. Unless the marketer has told the user what the hazard is, he has not, in my opinion, warned him. There are cases where the courts have held that the hazard is adequately implied by the statement of the Precautionary Measure, such as "Do not take internally" or "Keep out of the eyes." But there has never been much sense in relying upon a court's questionable willingness in some future lawsuit to agree that the implication is clear. State the reasonably foreseeable hazard simply and clearly. Do not expect the Food and Drug Administration to waive this one.

Of course, in order to state the hazards one needs to know the chemical, physical and toxicological properties of your product. Dealing largely in mixtures, the marketer's own tests of their properties and the experience of his own production people (and after a product has been on the market, the experience of users) are the real foundation of this knowledge. His chemical suppliers can be expected to give him the properties of what they sell; but not those of the marketer's mixture.

Some of us have an antipathy to including a *Precautionary Measure* where it is obviously and completely redundant and detracts from the curtness and the bluntness which is the primary virtue of a strong warning. For example, where a label says "Fatal if swallowed," I see little sense in adding "Do not take internally," and where the statement of hazard is "Prolonged and repeated breathing of vapor harmful," I balk at saying, in the next line, "Avoid prolonged and repeated breathing of vapor."

The Food and Drug Administration has the power, if it should agree, to state by regulation that the precau-

(*Continued on Page* 92)

* See footnote, bottom of preceding page.

THE SAMPLE SHELF

By Jerome N. Michell
vice president
The Walter Frank Organization
Hillside, Ill.

IT seems that this column needs further explanation.

Several prominent personalities connected with the aerosol field have expressed their opinions about the first three columns in this series. Some were complimentary, some critical, and a few thought we were "sticking our necks out" in mentioning specific products.

First, let us say that there is no intent to step on anyone's toes. We are honestly attempting to be constructive in our criticism, and our aim is overall benefit to the industry. How else can we do this without pointing with approval or disapproval at individual brands and packages? Second, these opinions are not *only* the opinions of this columnist. They are the concurrence of at least three design-wise packaging artists and engineers, so that individual taste is negated as much as possible.

We applaud and hold up as a design yardstick, Gillette's "Foamy" shaving cream aerosol. Here we have the clean, bright look and a minimum of extraneous copy which makes for instantaneous recognition of both brand and product. The lettering is big—the composition and eye direction is excellent—all in a top-notch design. How does your product compare?

We have chided the American aerosol industry for its design lag. In a recent English trade paper, and as reported in the February *Aerosol Age*, the marketing director of the British company which won the Grand Award in the 1960 CSMA competition said that—

"Touring American supermarkets, I found evidence that the well-designed aerosol pack, by British Standards, was outselling the inferior design. But I was surprised by the numbers of poor designs which would not even be given shelf space in British shops."

It is not pleasant to have our thoughts so confirmed—and we really don't want to belabor the point—but what is so—is so—and why hide it?

This month's example is of good design. Any aerosol marketer ought to be able to step away from his forest, hold up his own design against a good yardstick and ask himself honestly—"Is this product of mine well designed, or have I been kidding myself?"★

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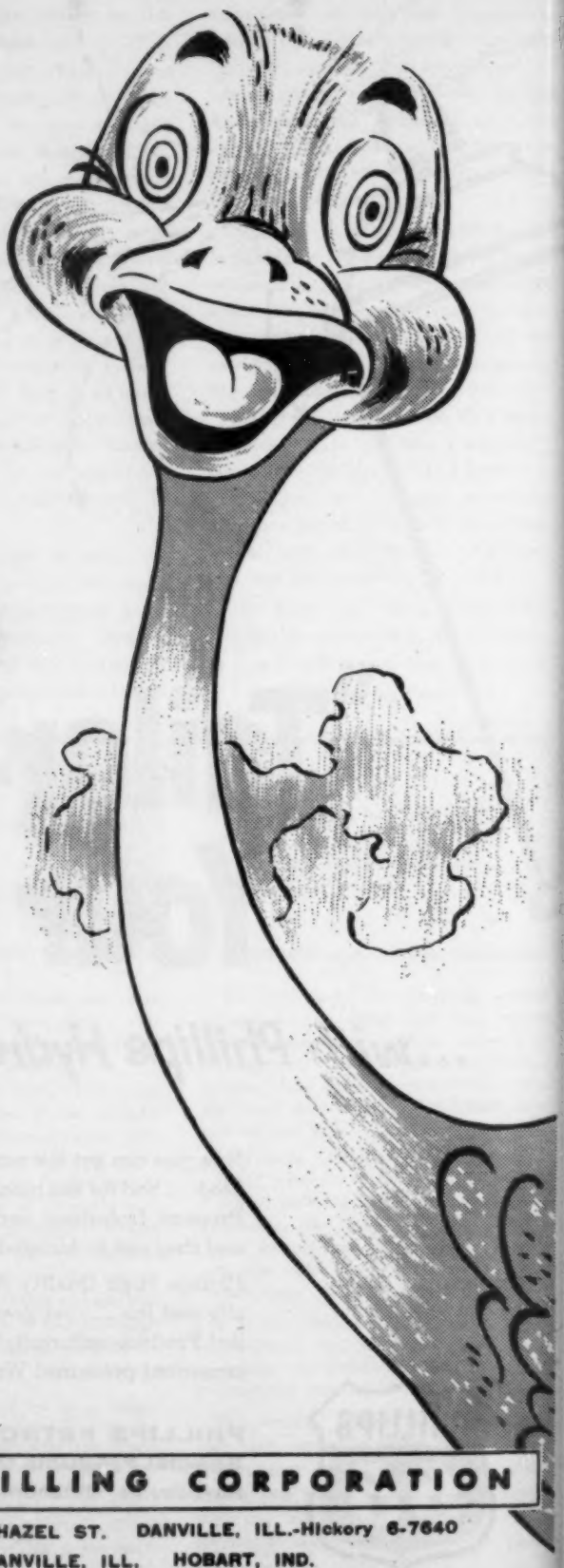

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This article appeared originally in the January 1961 issue of "Schimmel Briefs," monthly technical letter of Schimmel & Co., Windsor Highway, Newburgh, N. Y.

New Resins For HAIR GROOMING FORMULATIONS

(Nestle-LeMur photo)

HAIR lacquers are most needed to maintain the set of waved hair and to keep hair in place when the humidity is high. However, the aerosol hair lacquers based on polyvinyl pyrrolidone (PVP) lose much of their effectiveness under conditions of high humidity. Since the resin is quite hygroscopic, the lacquer film picks up moisture from the air and becomes softer and more tacky. Softening of the film allows the hair to relax from the configuration in which it was set. The copolymers of vinyl pyrrolidone and vinyl acetate (PVP/VA) are somewhat less hygroscopic than PVP but they still take up too much moisture in a humid atmosphere. The tendency of films of PVP and PVP/VA to become tacky can be counteracted to some extent by the use of certain plasticizers.

Non-tacky Hair Lacquer

An aerosol hair lacquer based on polyvinyl imidazole has been patented recently.[1] The lacquer yields a film which is said to be substantially tack-free at relative humidities of 50% to 90%. Polyvinyl imidazole (PVI) is related to PVP in chemical structure, as well as seen from a comparison of the formulas. Like PVP, the new resin is soluble in water and also in alcohol. Solutions of polyvinyl imidazole in alcohol are compatible with the usual aerosol propellants and propellant mixtures. Apparently this polymer has only been prepared on an experimental basis and is not commercially available as yet.

The following method of measuring the tackiness of lacquer films was used to compare polyvinyl imidazole with PVP and PVP/VA in regard to hygroscopic tendencies.[1] Films were prepared by pouring a 5% solution of each resin in anhydrous alcohol on a polished glass plate. The films were then conditioned for two hours at 72° F. and 90% relative humidity. A piece of aluminum foil was lightly deposited on top of each film and a rigid piece of aluminum plate (1" x 3" x 1/8") weighing 17 grams was placed on top of the aluminum foil. After two minutes, the aluminum plate was removed and the glass panel inverted. If the aluminum foil fell off, the procedure was repeated, adding weights on top of the aluminum plate until such time as the foil stuck to the film on inversion.

In this test, the added weight in grams needed to make the foil adhere is an indication of the tackiness of the film. Since PVP is very tacky at 90% relative humidity, the weight of the aluminum plate alone was sufficient to make the foil stick to the film, i.e. the added weight was 0 g. A weight of 40 g. was required to make the foil adhere to the film of polyvinyl imidazole, showing that the film was much less tacky than the PVP film. The results of all the tests made are shown below, the resins and resin mixtures being listed in order of decreasing tackiness at 90% r.h.

Resin	*Grams*
Polyvinyl pyrrolidone	0
PVP/VA (70:30) copolymer	0
PVP/VA (50:50)	5
PVP/VA (30:70)	10
PVP-PVI 70:30 mixture)	15
PVP-PVI (50:50)	20
PVP-PVI (30:70)	25
Polyvinyl imidazole	40

The PVP and the polyvinyl imidazole used in these tests both had a molecular weight of 30,000. It is interesting to note that the mixtures

of PVP and polyvinyl imidazole were less hygroscopic than PVP/VA copolymers in the same proportions.

Since cast films of polyvinyl imidazole are flexible and non-tacky, it is not necessary to include a plasticizer or special detackifying agent in aerosol hair lacquers based on the resin. Alcohol is need as a solvent for the polyvinyl imidazole in hair sprays pressurized with the common propellants. A mixture of propellants 11 and 12 in which 11 makes up 20-25% of the mixture is recommended in the patent. Polyvinyl imidazole is soluble in trifluoroethyl chloride in the absence of alcohol, so it could be used to prepare an alcohol-free hair spray. Such a composition would have the advantage of being non-inflammable when sprayed. Trifluoroethyl chloride is a new propellant which is also known as monochlorotrifluorethane.

Polyvinyl Oxazolidinones

Polymers of substituted N-vinyl oxazolidinones have been developed by the Dow Chemical Company.[2] These resins are related to PVP in chemical structure and their properties are similar in some respects. For example, they combine with phenols, iodine and some other substances to form complexes which are much less toxic and irritating than the original substances.[3] These are analogous to the PVP complexes. The polymer known as PVO-M is poly-N-vinyl-5-methyl-2-oxazolidinone (see formula). This resin, which is very soluble in water, is marketed under the name of Devlex 130. PVO-E has the same structure except that the methyl group is replaced by an ethyl group. PVO-E is not water-soluble but is soluble in most organic solvents.

Hair setting preparations based on the polyvinyl oxazolidinone resins have been patented by Tousignant *et al.*[4] The patentees claim that these resins are free from the objectionable odor which is found in some batches of PVP. The odor, which they describe as a somewhat "mousey" smell, is believed to be due to the formation of acetamide upon degradation of the PVP. The PVO resins have another advantage over PVP in that they are not appreciably hygroscopic.[2]

PVO-M in Wave-setting Lotions

PVO-M (Devlex 130) is recommended for use in aqueous wave-setting lotions.[4] The preferred formulation is based on the setting lotion patented by Mamlok and Schwarz.[5] This lotion contained PVP as the resin and urea and triethanolamine as agents for swelling the hair fibers. PVO-M likewise is more effective as a hair fixative when used in conjunction with these swelling agents. The proportions used are 2.5 parts by weight of PVO-M to 1.25 parts each of urea and triethanolamine and 95 parts of water.

In an experiment described in the patent, this lotion and a similar lotion containing PVP were compared for hair setting strength with a control lotion containing only urea and triethanolamine. Locks of hair were dipped in the lotions, then wound on curlers and dried. The rate of curl fall out was then determined under different condition of temperature and humidity. While the PVO-M film seemed to hold the curl better than the PVP film at each humidity level, the difference was due in some measure to the fact that the locks of hair picked up more PVO-M than PVP from the solutions (3.1% and 2%, resp.) The PVP lotion was not any more effective than the control lotion in this test.

For use in aerosol hair sprays, PVO-E has the advantage over PVO-M of being more soluble in alcohol-propellant mixtures. However, it is less soluble in water and might not wash out of the hair very easily. PVO-E is not produced commercially at present. A copolymer of PVO-M and PVA is marketed under the name of Devlex A515. This copolymer generally is more compatible with organic solvents than PVO-M, but it does not happen to be very soluble in alcohol propellant mixtures. In order to prepare a satisfactory aerosol lacquer from Devlex A515 it is necessary to make use of co-solvents such as methyl chloroform (1,1,1-trichloroethane) or methylene chloride.[6]

From the descriptions in the patents, it appears that polyvinyl imidazole would be particularly suitable for the preparation of aerosol hair lacquers, while polyvinyl methyl oxazolidinone would be more useful in aqueous hair setting lotions. The development of non-hygroscopic resins of the same general class as PVP should make it possible to prepare hair setting preparations which are more effective under humid conditions than those now on the market.★

1. U.S. 2,953,498. Werner (to General Aniline & Film Corp.) Sept 1960.
2. U.S. 2,919,279. Walles *et al.* (to Dow Chemical Co.) Dec. 1959.
3. Ind. Eng. Chem. 52: 40(Dec. 1960.
4. U.S. 2,948,656. Tousignant *et al.* (to Dow Chemical Co.) Aug. 1960.
5. U.S. 2,793,980. Mamlok and Schwarz (to Dresset Corp.) 1957.
6. Root M. J. Am. Perfumer 75(10): 43. 1960.

Whither the Hair Spray Patent?

Two full months after the LaMaur hair spray case was decided in favor of LaMaur's patent right to polyvinyl pyrollidone and its copolymer in hair sprays, the industry is still somewhat warily watching the major competitors. G. Barr & Co., Chicago filler, who lost its arguments in the case, has announced definitely that it WILL APPEAL. LaMaur, Inc. has not yet made any official trade announcement of what it wants in the way of license fees, though industry reports indicate the company is actively dickering with major hair spray marketers. LaMaur has given no indications of further court action, instead indicates it would like to avoid any more costly litigation.★

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THE SCIENCE OF

AEROSOL VALVES

By George P. Macura
Director of Technical Services
V.C.A., Inc.
Bridgeport, Conn.

DUE to the large number of variations possible with valve components, the filler, marketing firm, research laboratory, or any other organization involved in developing aerosol products should answer any questions about the product the valve manufacturer may ask. It is only by doing this that the developer of the aerosol product can make fullest use of the many resources of the valve manufacturer. An examination of the modern variations available for use on aerosol products, even within the standard one-inch opening, will reveal the soundness of this argument.

The standard aerosol can valve may be defined as "a mechanical device which dispenses a material, or materials, under pressure by depressing the actuator to allow the product to be released."

The following components make up a valve:

1. Button
2. Stem
3. Diaphragm
4. Mounting Cup
5. Spring
6. Tail or Housing
7. Dip Tube

We will take each component and discuss its variations in material, size, and function that it has in the valve.

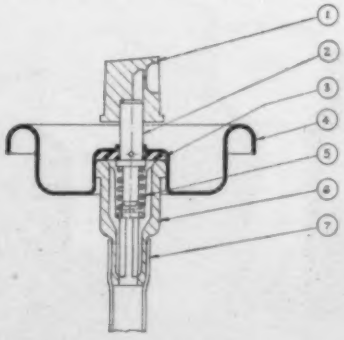
1. *Button*

The button can be made of various plastics, such as:

(a) Nylon
(b) Polythylon
(c) Linear Polyethylene
(d) Delrin
(e) many other types

The material used is dependent on the product being dispensed and its effect on the plastic. Some products will swell the plastic, others will shrink it, create excess stress, and thus, crack the button. The orifice size of the button varies, once again, depending on the products, and its use. Some require fine sprays, others require streams, and each spray characteristic varies as a function of the orifice size or along with the stem orifice and housing. The orifice varies from .014" to .060" hole diameter. There also is a mechanical break-up button which has variations that can give a spray characteristic of a narrow to a very wide cone, depending on the orifice size and depth of the swirl chamber.

The actuator button is one of the three parts in the valve that will have a major effect on achieving the spray pattern that is necessary for dispensing the product properly.



2. *Stem*

The stem is the component upon which the button is placed in order to dispense the contents. The materials that this component can be made from are:

(a) Nylon
(b) Delrin
(c) Brass
(d) Nickel, Silver
(e) Nickel-Plated Brass
(f) Others, Plastic or Metals

The function of this particular component is to allow the product under pressure to be expelled by passing the orifice of the stem below the diaphragm. The orifice of the stem can vary in size from .015" to .030" in diameter, or the stem can have multi holes. The larger the orifice area, the greater the flow of the product; and conversely the smaller the orifice area, the less is the product flow. This component is in contact with the product at all times at the base while the top half is exposed externally to the aerosol valve.

3. *Diaphragm*

The diaphragm is the rubber component that seals the product in the can and prevents it from leaking around the stem (one of two places the valve could leak). The materials currently being used for this are Buna-N or Neoprene, but presently there are new compounds of rubber that are being perfected so that the chemical in the aerosol can will not excessively swell or shrink the rub-

All this for me?

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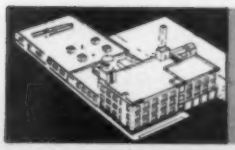

ACRES OF AEROSOL PACKAGING FACILITIES

ber. This should allow for a long shelf life for the aerosol product.

4. *Mounting Cup*

The mounting cup is the means by which the aerosol valve is crimped to the container in a way to prevent any of the pressurized material from leaking out of the can. The seal is achieved by a compounded gasket that seals the valve to the container and allows the pressurized product to be held within the can without any leakage. The mounting cup is usually made out of one pound of tin plated steel or, 3 SO aluminum. Both materials can be epoxy-coated to prevent any chemical reaction with the metal.

5. *Spring*

The spring is the component that returns the stem after the downward pressure on the button has been released. The material of which this component is made is stainless steel, type 305. If a heavier spring is necessary, for a faster or more positive return, the spring tension can be varied by a heavier gage wire or by adding to the number of coils in the spring.

6. *Tail or Housing*

This component is staked into the mounting cup and against the rubber diaphragm retaining the spring and the stem. To the bottom of the tail is attached the dip tube, either over the housing or inside a provided niche at the bottom of the housing.

The tail is most commonly made from nylon but, with the recent introduction of Delrin it also shows a great possibility of use. In some valves, metal tails are used. These are made of brass, stainless steel, type 305 and all types of plated brass such as nickel or nickel silver. The other major variations in the tail are of the opening and the vapor tap. The tail opening will be one of three contributing factors to the spray rate. Varying the size of the tail opening from a minimum of .013" to a maximum of .100" will allow for minimum spray rate and a maximum spray rate. The vapor tap, which allows for the product and the vapor to be sprayed in either the upright or inverted position will also vary in size and thus contribute to the variation of the spray rate. The size of the vapor tap hole will depend on the type and the amount of propellant used, along with the final desired spray rate.

7. *Dip Tube*

The majority of dip tubes are made of polyethylene or nylon. The use of either depends on the chemical reaction with the material. The inside diameter of the dip tube once again is important from the standpoint of

(*Continued on Page* 83)

Aerosols to be Feature at Packaging Show

THIS gleaming new building, Chicago's brand-new Exposition Center, will be the major attraction this month as packaging executives, marketers, and researchers gather in Chicago April 10-13 for the 30th National Packaging Exposition. The $34-million structure puts all exhibits on one huge, unobstructed air conditioned floor.

The attention of the many aerosol marketers and packagers who attend the 1961 exposition will have to be widely divided this year. New containers, valves and even propellant systems will vie with new filling equipment, caps, etc.

Among the many highlights for the aerosol packager will be these:

1. *Air Reduction Co.* will show some new formulations for non-food aerosols powered by compressed gases.

2. *American Can Co.* will show a wide range of aerosol products using its cans; and its Bradley Sun Division will publicly unveil the new aluminum piston container for the first time.

3. *Continental Can Co.* will have part of its booth devoted to aerosol packaging, and will show its new "nibbed top" can.

4. *Crown Cork & Seal Co.* will feature a magician who will give continuous performances of sleight-of-hand tricks with an aerosol flavor. Among his tricks will be one in which he "produces" a can of chocolate syrup from some cocoa beans.

5. *DuPont's "Cell-O-Seal" Division* will show its pilfer-proof can wrappings, and the *"Freon" Division* will feature formulations using the new corrosion-inhibited "Freon 11" and "Freon C318".

6. *Eriez Manufacturing Co.* will show its magnetic rail conveyors especially designed for aerosol water baths.

7. *General Chemical Division of Allied Chemical Corp.*, will once again offer its "Aerosol Information Booth," a special feature of the show geared to tell new packagers of recent aerosol developments.

8. *Adolph Gottscho, Inc.* will show a variety of aerosol coding units.

9. *Kartridg Pak Co.* will introduce two new filling units, one an under-the-cap high-speed propellant charger, the other a 'coaxial" product filler which is said to employ a new technique of can filling.

10. *Monroe-Danford & Co.* will show a whole series of new cologne containers and caps, in both plastic and metal.

11. *Owens-Illinois Glass Co.*, will show a dozen or more new bottle shapes and colors for plastic-coated aerosol containers.★

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(photo: Dr. Scholl's)

POWDER DISPENSING

new potential for the aerosol package

By Peter W. Sherwood
Research Engineer
White Plains, N. Y.

ONE SEGMENT of the aerosol market which has hardly been tapped is powder aerosols. Covering the entire range of products which are best applied in the form of a dust—and which are *not* soluble in aerosol propellants — the potential list of applications for this type of product includes pharmaceuticals, fungicides, cosmetics, household products, lubricants, and insecticides.

The enormous potential for this type of package has been stressed over and over again. According to E. E. Husted, of Union Carbide Chemical Co., an existing $250 million powder market in the United States alone offers fair game for the aerosol can. This total includes $108 million in cosmetic and pharmaceutical products, $98 million in cleansing powder, and $44 million in pesticides. Granted, this is the market for all conventionally packaged products of this type, and aerosols may eventually capture only a small portion of it, but the total market is impressive indeed.

Beyond this existing potential, there are large areas in which aerosol powder dispensing may provide the entree by which effectively formulated powder formulations can be used to displace creams, liquids, and slurries which presently hold a major share of the market. For instance, of $250 million worth of dentrifice, only about 3% is presently sold in powder form. The $104 million deodorant market supports only about 7% powder, most of it in squeeze bottles. Of the $15 million worth of toilet bowl cleaners sold in 1959, none was in powder form. Instead, the effective ingredient is sold suspended in water, with all the resulting waste in freight and storage requirements.

Despite this large target, powder aerosols made up only a tiny fraction of the approximately 680 million cans sold in the U. S. last year, or of the 23 million units sold on the Canadian market during that year. However, the technical knowledge and equipment have been improved to a point where they can bring about a rapid growth of the powder aerosol.

THE TRUE powder aerosol consists essentially of the solid ingredient (usually 10 to 30% by volume) and the propellant, in which it is insoluble. In addition, as we shall see, a small quantity of wetting or suspending agent may be included. When this type of formulation is ejected from the valve, the propellant evaporates immediately, leaving the powder residue.

Among the several reasons why aerosol dispensers offer the ideal packaging medium for many powders one major one is ease of application. For example, dry lubricants can be directed to almost inaccessible corners and their rate of application can be carefully controlled. Also, the airtight closure of the aerosol can provides valuable protection to the product subject to deterioration by bacterial attack or by the action of air or moisture. The aerosol package also prevents pre-sale tampering with the contents, and will minimize waste.

Perhaps the major drawback to exploitation of these advantages has been technical problems. Early pressurized powder packages have been beset by valve clogging due to deposit of particles in the valve passages. Leakage has been caused by lodging of powder particles under the valve seat. Sedimentation of particles in the can, resulting in formation of "mats" of powder at the can bottom. has been another difficulty.

Much of the impetus for overcom-

ing these problems has come from work done to overcome related problems in the fast growing aerosol paint field (U.S. sales volume: 80 million cans last year). In these formulations, pigments occur as insoluble solids, though the presence of solvents or carriers obviously makes the problem somewhat less critical in paints than in true powder aerosols.

One of the first commercial powder aerosol products was a sodium bicarbonate-based fire extinguisher. Here, however, the product was applied by puncturing the valve seat, thereby eliminating the problem of valve reseating and clogging in the orifices.

Other earlier applications included the use of dry powder zinc stearate in mold release applications and of dry graphite as a lubricant. Very low concentrations of powder (10 to 15%) were used with the propellant, and in most cases the products haven't been commercially accepted because of this low concentration of useable product.

The smooth operation of the aerosol powder dispenser is governed largely by the following factors: particle size, choice of propellant, modifying agent (if any), and valve design.

Today, the trend is toward use of smaller particle sizes in solids-containing aerosols. Recent experience permits handling powders in the size range of 50 to 75 microns at a solids concentration of 10%. Solids content of 20% and even 30% can be handled at 35 microns, while a maximum of 150 microns has worked effectively in very dilute suspensions.

Particle shape is also of importance. Risdon Manufacturing Co.'s Walter C. Beard has reported difficulties in formulation with needle-shaped or fibrous particles which tend to intermesh and form a precipitate which leaves deposits in the valve passages and seat. Much the same problem is encountered in materials which have some limited solubility in the propellant (as for example DDT in the fluorocarbons), since they will form a deposit in the spray nozzle upon evaporation of the solvent.

Compatibility of powder with the propellant is significant not only in the area of solubility, but also because of the necessity of there being no chemical reaction between the components of the formula. Other considerations in the physical characteristics of the powder itself include specific gravity, wettability by the propellant, bulk factor, etc.

The relative density of propellant and powder is crucial. According to Mr. Beard, sedimentation in the dispenser can be largely avoided if the specific gravity of the propellant is a maximum of 0.8 below that of the suspended powder. Because several combinations of fluorocarbon propellants have normally desired propellant effect (app. 25 psig. at 70° F.) the aerosol packer has at his disposal a range of propellant densities for selection with the powder to be dispensed. For many aerosol powder formulations, a suitable and relatively low-cost mixture of propellant contains 65% propellant 11 and 35% propellant 12. Specific gravity of this mixture is 1.39.

In some instances, sedimentation may be avoided by the addition of wetting or suspension agents. Such additives complicate the formulation problem, especially in medical and cosmetic applications where the presence of extraneous material is often objectionable. In any formulation, the suspension agent must be not only active in its anti-sedimentation function, but not be able to be detected by the user (e.g. it must be essentially odorless, greaseless, and non-irritating) and should not in any way impair the operation of the aerosol container. Victor DiGiacomo, of Givaudan-Delawanna Corp., reports very good performance in the use of isopropyl myristate as a suspension agent for a wide range of powder aerosols.

Valve design for powder aerosols has taken the line of allowing free access of the packaged slurry of the valve seat and of providing an extremely short path (only a few thousands of an inch) from valve seat to spray orifice. Furthermore, the valves are usually provided with sharp shut-off and high seating pressure. In handling specially large powders of particles which cannot be crushed by normal valve cut-off, however, a compromise may be necessary. In such instances, clogging can sometimes be avoided by providing a seat made of flexible material.

For aerosol powders, the filling operation presents no special problem. Either pressure or cold filling techniques are applicable, and the powder may be either placed in the can in dry form or as a suspension in the propellant. In pressure filling it may be advisable to feed a suspension of powder in the higher boiling point component of the propellant system, with the light components charged separately.

With most of the major technical problems solved, widespread adoption of powder aerosols has now become primarily a marketing question. As has been indicated, the incentive is large. One market analysis indicated that the U. S. market potential for this type of product may exceed one billion units per year, and suggests that this potential could be realized in as little as five or six years.★

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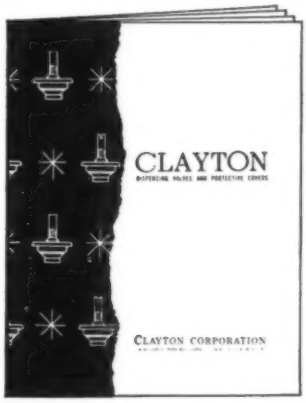

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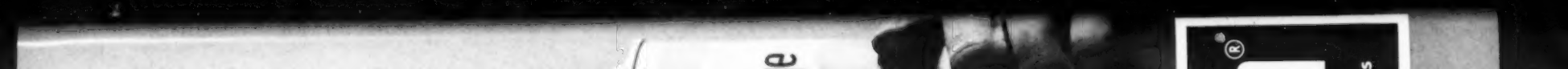
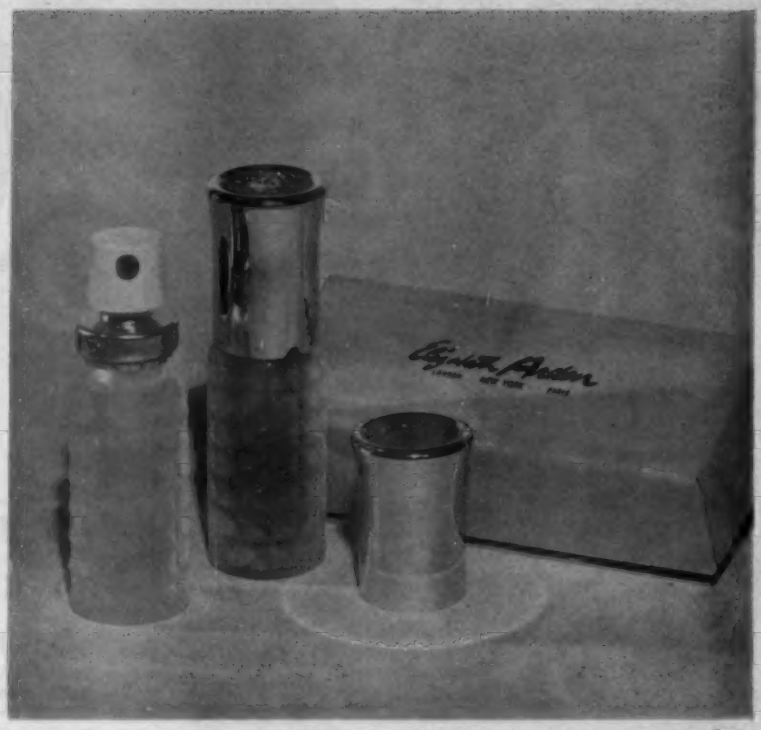


Weedone Spot Grass Killer is a new product of Amchem Products, Inc., Ambler, Pa. Said to be the answer to Quack Grass, Muhlenbergia, Bermuda Grass and other undesirable wild grasses in lawns, it will retail at $1.98.



Elizabeth Arden, New York, has introduced its **Blue Grass, On Dit, My Love, Memoire Cherie, No. 450,** and **Valencia** in this frosted 2½-gram Foster Forbes bottle. Overcap is by Metal Fabrications, Waterbury, Conn., and "B18F" metered valve is by VCA, Bridgeport. Outer box is by Douglas Young, Pawtucket, R. I., with fragrance identify motiff (at top of cap) by Park Name Plate, Flushing, N. Y.

Redi-Spare is a flat-tire repair package marketed by Consolidated AeroTech Corp., New Haven, Conn. Containing butyl latex to seal as well as inflate the tires, the product uses an aluminum container and a variation of a standard tire valve.

NEW PRODUCTS AND PACKAGES

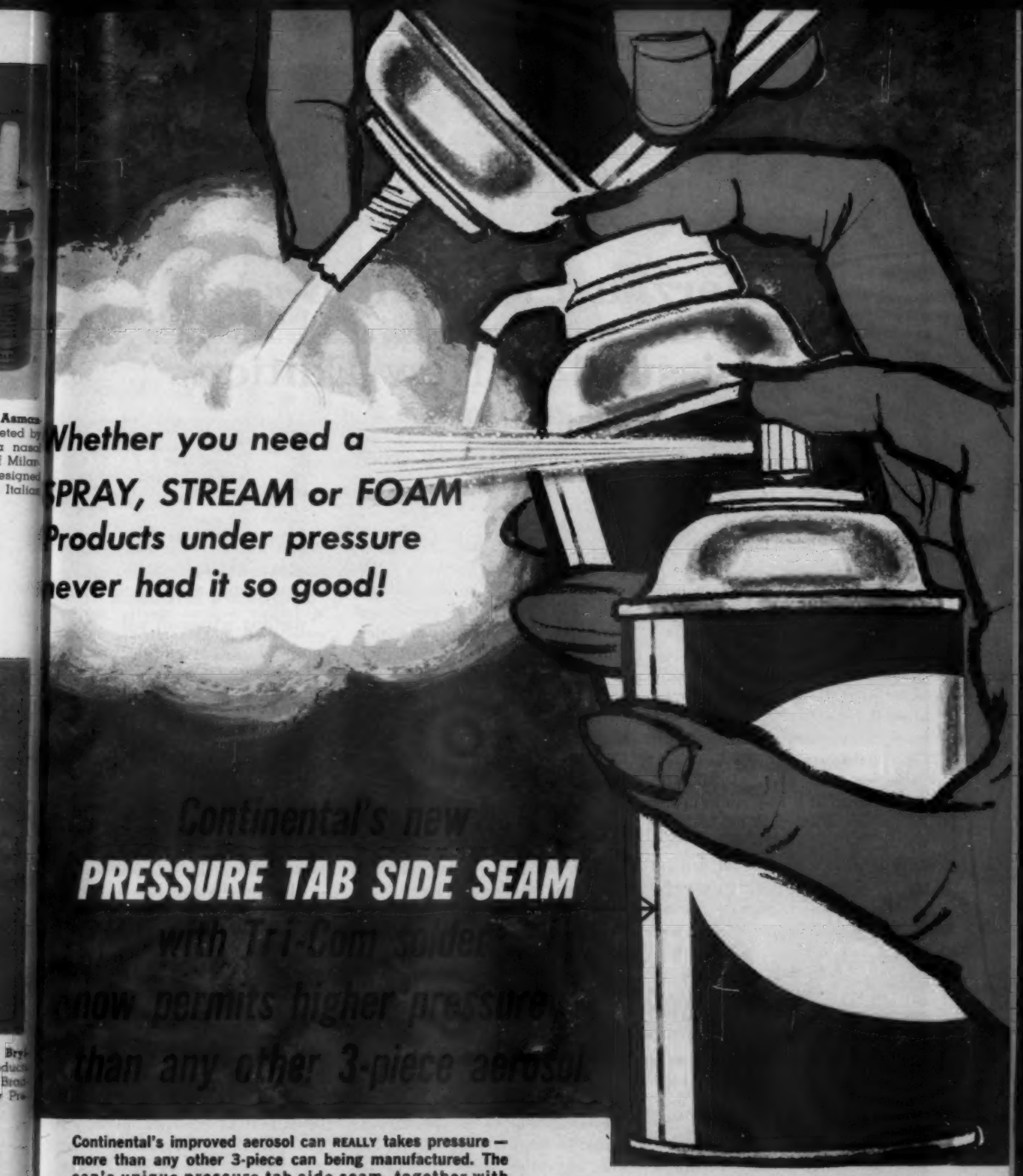
Rayette, St. Paul, Minn. has introduced its **Hair Brite** and **Aqua Net** hair sprays in a 85 cc. Peerless Tube which uses a VCA valve and actuator. White plastic overcap is by LaBarb, Armonk, N. Y.

Two new Italian aerosol products are (left) **Asmanex Valeas Spray**, an oral spray for asthma marketed by Valeas S.P.A., Milan; and **Neo Rinoleina**, a nasal spray marketed by E. Granelli, S.p.A., also of Milan. Both use metered valves and specially designed actuators made by Solfrene, S.p.a., Milan, Italian licensee of Risdon.

Yardley of London has introduced its fragrance line in a 3-oz. aluminum container by Peerless Tube, with an all-plastic trigger tip by Metal Fabrications, Inc., Waterbury, Conn. and valve by VCA, Inc., Bridgeport. Unit is decorated by Seri Print, Waterbury.

First piston container is this one for **Brylcream**, a product of Beecham's Products Inc., Clifton, N. J. Package uses new Bramley-Sun piston container, and valve by Precision Valve Corp.

Helena Rubinstein has introduced its **Heaven Scent** in this uncoated glass bottle (by Foster Forbes) with a decorative cap by PharmaPlastics, Inc., Baltimore. Valve is a "Micro-Mist" unit made by The Risdon Manufacturing Co., Naugatuck, Conn. Package will retail for $3 pus tax.



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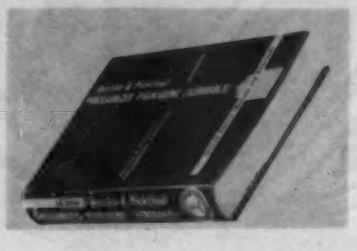
A BOOK REVIEW



Pressurized Packaging (Aerosols), Seco Edition, by A. Herzka and J. Pickth Published by Butterworth's Publicatio Ltd., London, and Academic Phess, In New York: 509 pages, $15.

Herzka-Pickthall Book Re-issued in New Edition

"Invaluable list of suppliers, 200 formulas, make new edition worth the price."

AEROSOL literature, which is normally confined to this magazine and scattered articles in half dozen others, is experiencing a hardcover resurgence these days. In the wake of the January publication of "Aerosols: Science and Technology," edited by H. R. Shepherd (and published by Interscience Publishers), comes word from the British and U.S. publishers of "Pressurized Packaging (Aerosols)," by Herzka and Pickthall, that they are bringing out the second edition of this book on April 1.

This excellent first of all aerosol technical volumes, which has already had considerable mileage in laboratories and filling plants all over the world, first appeared in print late in 1958. Reviewed in the February, 1959 issue of *Aerosol Age*, the book's first printing has been sold out at least six months ago.

Since publication of the first edition, the business affiliation of both authors has changed. A Herzka, then of the Research Department of The Metal Box Co. Ltd., has formed his own consulting firm, Pressurized Packaging Consultants Ltd. Jack Pickthall, chief chemist of Polak & Schwarz (England) Ltd. through a merger of P & S with van-Ameringen Haebler, now carries the title "director and chief chemist, International Flavors and Fragrances (Gt. Britain)." Mr. Herzka is still a frequent contributor to *Aerosol Age*, and both Messrs. Pickthall and Herzka are quite often heard giving formal aerosol papers before pressurized packaging discussion groups both in Britain and on the Continent.

THERE are basically two major changes in the second edition. A chapter on compressed gas propellants, which was very short in the first printing because the nitrogen package had not yet become commercially significant, has been "beefed up" to include quite a bit of material on such factors as product viscosity, cavitation, and calculation of ullage. A valuable table is included on "Solubility of Gases in Edible Fats and Oils."

Another major improvement is the inclusion of an entirely new chapter outlining the legal considerations which the aerosol packager faces. This consists of an excellent 20-page listing of important aerosol patents, plus an entire section devoted to shipping and packaging regulations in the United Kingdom, West Germany, Norway, South Africa, Switzerland, and the U. S.

Each of the regular chapters is liberally illustrated with graphs, charts, and some excellent photographs, and each contains a separate reference listing to enable the reader to further explore specific subject material. Both authors have an excellent command of the English language, and the text consequently is concise and well written.

The index of the book contains the invaluable listing of suppliers, not only those in Britain but also all over the world. So far as is known by this reviewer, this list is unique and not generally available in any other single volume or trade publication.

After considering just a few of the many assets of the book, one should weigh them against the liabilities. For one thing, the price has gone up from $12 to $15, but the additional 100 pages make the additional price well within reason.

As with most hardcover books (see the review on "Aerosols, Science and Technology" in the March issue of this magazine), the time-lapse between completion of manuscript and final publishing is a matter of nearly nine months. This legislates against inclusion of any text material dated later than June of 1960, and necessitates the inclusion of some companies, which have since gone out of business, in the company listing at

(*Continued on Page* 90)

IMPACT

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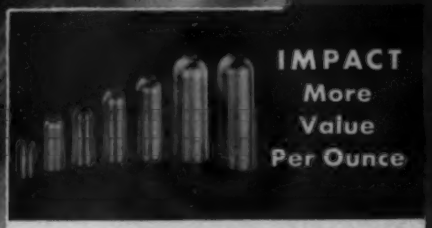

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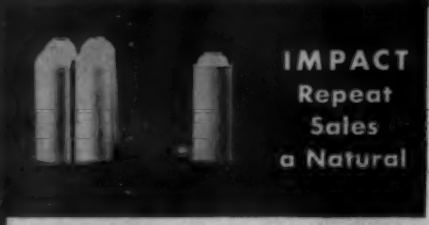

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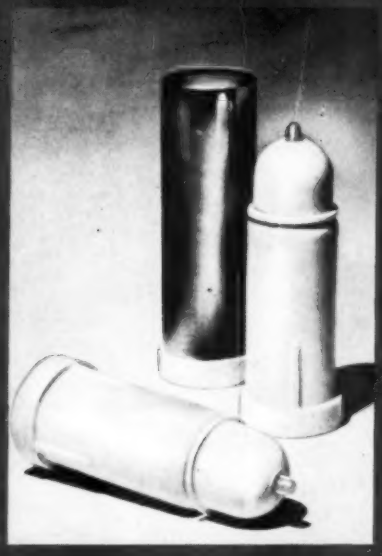

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By Dr. Otto Karl Jacobi*
Kolmar Research Center
Weisbaden, Germany

The Problem of Compatibility

in aerosol pharmaceuticals and cosmetics

THE TERM "aerosol" usually connotes a dispersion of minute solid or liquid particles in gas, with air generally considered as the gas phase of the "aerosol." There *are* aerosols in other kinds of gas, and aerosols very frequently occur in nature or as a result of some industrial or human activity.

The size of the particles of the dispersed solid or fluid portion of the "aerosol" is important in its characterization. Root[1] makes a most impressive classification of the different types of aerosols according to particle size:

	Microns
Rain	100 to 1,000
Oil spray for oil burners	100
Atmospheric nebula	2 to 15
Tobacco smoke	0.2
Aerosol spray products	1 to 100

This paper will be restricted to those aerosols which fall under the industrial definition of "a spray or foam product (confined in itself) in which the propellant force is represented by a liquefied gas or a gas under pressure." Moreover, only those products which might be produced by the cosmetic or pharmaceutical industries are considered.

For the formulation of aerosol products, four systems are currently available:

1. The three-phase system, in which the propellant, the product concentrate (not mixed with the propellant), and the gas phase exist as separate entities.

2. The two-phase system, consisting of the propellant (in which is dissolved the active ingredients) and the gas phase.

3. The emulsion system, in which the propellant is emulsified in an aqueous system.

4. The dispersion system, in which the active product in insoluble in the propellant mixture, but may be dispersed therein. This system is characterized by powder sprays and similar products.

The three-phase system allows only very coarse sprays since the propellant serves merely as the mechanical pressure potential only so that the aqueous phase is dispersed. The two-phase system is the one favored in the aerosol industry, despite the fact it requires that the active ingredients be soluble in the propellant. In this system the fineness of the spray can be varied by selecting the propellants and then adding certain substances later. For instance, if the surface tension is reduced, it will result in finer sprays. Solvents of very low vapor pressure, for instance, heavy mineral oils and silicones, increase the average size of the aerosol particles, producing coarser sprays.

For the emulsion system, Sanders[2] states that oil-in-water emulsions result in foaming aerosols, while water-in-oil emulsions do not foam and produce finer sprays. According to Herzka[3], the use of a propellant, entirely insoluble in the product, is necessary for aerosol toothpastes. So far the only liquefied propellant which appears to meet this requirement is octafluorocyclobutane ("Freon C318"). However, so far use of this propellant is not permitted for edible products. According to Herzka, the second-best propellant for aerosol toothpastes is nitrogen.

For the dispersion (or powder-spray) system the major problems are development of suitable non-clogging valves and control of particle size.

For which types of products in the cosmetic and pharmaceutical industries will the aerosol package be suitable? The answer once was: "Everything which can be sprayed is suitable for aerosol packaging!" But what is currently being marketed in aerosol form for these industries?

For the cosmetic industry, room deodorants, hair lacquers, liquid hair nets, wave sets, shaving creams, anti-perspirants, deodorants, perfumes, eau de colognes, toilet waters, hand lotions, sun tan preparations, shampoos, insecticides, tooth pastes, skin lotions. More recently developed aerosols are: baby oil, baby talcum, wound antiseptics, nail varnishes, breath disinfectants and purifiers, body oil, and many others.

For the pharmaceutical field the potential for aerosols is perhaps even larger than for the cosmetics field. Though their use to date has been relatively limited, their range of pos-

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* Presented at the Second European Aerosol Congress in Dusseldorf, Germany, on April 28th, 1960.

sible application is very large.

What are the advantages offered by the aerosol package for pharmaceutical products? The negative (often highly detrimental) influences of light, humidity, and minerals on medicaments can easily be eliminated through use of the pressurized package. Usually the means of application is better, thus preventing loss of or imperities in the medicament. Also the pains often caused when applying the medication can in most cases be lessened or eliminated, and it is probable that medications applied in aerosol form may penetrate better.

E. Pomerantz[4], testing the durability of various medicaments in aerosol form, found ascorbic acid and thiamin to be *more* stable in a nitrogen aerosol package than in a conventional one. However, contrary to what might have been expected, vitamins A and B 12 showed *no* increased stability in the nitrogen aerosol package, although in foams and lotions in aerosol form (using the halogenated hydrocarbons or nitrogen as the propellant) there was no negative effect on the stability of vitamin A. The same applied for neomycin and hydrocortisone in an aerosol formulation, and it was demonstrated that a formulation of neomycin hydrocortisone with polymycin in foams and lotions was influenced neither by halogenated propellants nor by nitrogen.

In this connection one interesting and important diagnostic application for aerosols should be mentioned. A relatively simple and rapid method of diagnosing cancer of the lungs is to cause the patient to inhale warm, minutely-sprayed propylene glycol particles, which will cause him to eject sputum from areas of the lungs previously impossible to reach. A microscopic investigation of the sputum reveals the presence of cancer cells if there are any.

Today at least 50 different pharmaceutical products in aerosol form are on the U. S. market. Among these are: asthma remedies, cold remedies, burn sprays, local anaesthetics for skin and tooth treatments, antimycotics, poison ivy sprays, adhesives, etc. Still another group of products includes adhesive removers, mouth sprays, nose sprays, external antiseptics, foot perspiration sprays, and drying, cooling, and astringent preparations for the treatment of skin and feet. Recently successful products have been a dermatitis preparation and a multi-vitamin formulation for children.

At the Pharmaceutical Aerosol Symposium in Philadelphia in 1957, it was suggested that the following are very good prospects for aerosol packaging: hormones, vitamins, antihistamines, calamine, zinc oxide, sulphur, resorcin, tar preparations, skin itching remedies, anti-pruritics, skin protection remedies, and cleansing, soothing, and smoothing lotions for the skin.

One area which may offer a particularly promising future for pharmaceutical aerosols is therapy of diseases of the ears, nose, and pharynx. So far very little work has been done to ascertain exactly how aerosols may be used in the therapy of the ears, yet it should be possible to obtain a better penetration of the medicament in the region of the middle ear if it is applied as an aerosol. To a limited extent dentistry *has* made use of aerosols. They are employed as local anaesthetics, tranquilizers, astringents, and antibacteria remedies. There is also marked interest in aerosols as a prophylaxis in the oral cavity. The development of aerosols for possible use in treating rectal and vaginal diseases and conditions so far has attracted little attention.

At this point it should be made clear that when we refer to the term "compatibility," we refer not to compatibility within the aerosol container but rather to the compatibility of the sprayed product with the target application—in most cases, the skin or the mucous membrance.

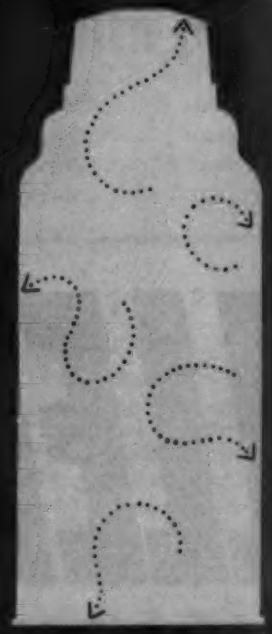
One significant factor in this discussion is that *a finished product which is perfectly harmless in conventional form may lose this property when packaged as an aerosol.* This change may be caused by the achievement of finer dispersion, which creates a many times enlarged surface for the medication. This finer dispersion causes a more intensive contact of the preparation with the organ.

However, there are also toxic by-products (sometimes the result of unforeseen reaction between product component and propellant) which will play an important role in selection of the best propellant for a particular formulation. Carbon dioxide, helium, argon, and nitrogen are all well known to be non-toxic, and of these nitrogen probably will find the widest range of application for pharmaceutical aerosols. The fluorinated hydrocarbons, which presently serve as the propellant for most aerosols, may also be considered as practically non toxic—but more on this point later.

In respect to the end product, A. Pomerantz—among others—urges strongly that toxicologic and skin irritation studies be completed *before* market introduction of the product. Root[5] points out the importance of toxicity and skin compatibility tests for aerosol cosmetics. As is fairly evident, with aerosols this testing requires special attention because of the vapor concentrations which are the unique product of the pressurized package. The effect produced by inhalation should also be considered and tested most carefully. And still another item for consideration is possible cooling effect of the propellant on localized areas of the skin. Root[1] and Herzka[6] recommend the formulation of so-called "warm spray" to correct this situation, advocating the use of propellants with low boiling points. Another approach is that of Mina[7] who suggests that the effect of undercooling can be eliminated by employing a high boiling propellant (such as dichloro tetrafluoroethane) in the smallest possible quantities.

How about the toxicity of the propellants themselves? According to Reed[8], the fluorinated hydrocarbons

IS YOUR PRODUCT DELICATE UNDER PRESSURE?



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THROUGH

New "FREON-11"S reduces corrosion and storage problems with products containing alcohol

Development of new "Freon-11"S removes a sales barrier to countless aerosol products already in existence — creates bright new sales prospects for many others that have never reached the production stage. This new propellent now minimizes the corrosive action that once limited both the storage life and quality of products containing alcohol and propellent-11.

What is "Freon-11"S?

Exhaustive research by Du Pont scientists has shown that corrosion of nonaqueous aerosol products containing alcohol and propellent-11 is caused by hydrochloric acid formed in a free radical reaction between the two—not by hydrolysis of the propellent. "Freon-11"S is Du Pont Freon-11* with a successfully proven stabilizer† that now inhibits this reaction in products containing alcohol.

What are its immediate advantages?

By inhibiting acid formation in aerosol products containing alcohol, "Freon-11"S:

1. **Practically eliminates container corrosion.**
2. **Greatly lengthens shelf life.**
3. **Prevents development of unpleasant odors or discoloration—previously caused by the free radical reaction.**

For what products?

You name them. If they contain alcohol, new opportunities are yours. Some products already being successfully formulated with "Freon-11"S include:

- **Hair sprays**
- **Personal products**
- **Room deodorants**

*FREON- and F- followed by numerals are Du Pont's registered trademarks for its fluorocarbon propellents.

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The price of new "Freon-11"S will be the same as regular "Freon-11". Availability? Immediate, in bulk quantities.

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Samples of "Freon-11"S can now be obtained from your nearest Du Pont sales office. For technical advice and information, write to: Du Pont Co., "Freon" Products Div., N-2420AC, Wilmington 98, Del.

†Patent applied for.

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have a relatively low inhalation toxicity as a group. This data was based on investigations made by the Underwriters Laboratories and published by E. I. du Pont de Nemours & Co. Guinea pigs were exposed to breathing various air-and-gas combinations and each animal was then studied.

Classified according to declining toxicity, the gases were ranked as follows:

Sulfur dioxide—A concentration of ½ to 1% is lethal or causes serious harm within five minutes.

Ammonia and methyl bromide—Concentration of ½ to 1% is lethal or causes serious harm within one-half hour.

Carbon tetrachloride, chloroform, and methyl formate—Concentration of 2 to 2½% is lethal or causes serious damage within one hour.

Dichloroethylene, methyl chloride, and ethyl bromide—Concentration of 2 to 2½% is lethal or causes serious damage within two hours.

Propellant 113(CCl_2F-$CClF_2$)—Less toxic than above group.

Propellants 11(CCl_3F) and 22($CHClF_2$)—Considerably less toxic than the above group. Their toxicity is equal to that of carbon dioxide.

Propellants 12(CCl_2F_2) and 114($CClF_2$)—Concentrations of at least 20% do not seem to cause any harm within two hours.

Reed cautions that this relatively low toxicity of propellants may not be simply "transferred" to any finished aerosol product. Besides the effect of the individual components and component combinations, we must also deal with the special physiological activity associated with the effect of the extremely fine particle size. Horn[9] also calls attention to the risk involved in inhaling cosmetics in the form of aerosol sprays, and recommends complete inhalation tests. Though the necessity for such tests may at first seem superfluous in the light of data accumulated on the same product and the skin, the same chemicals used in an aerosol formula can cause serious injury to the respiratory tract. It should be emphasized that the surface of the lungs is approximately 25 times as large as the skin surface of the human body. Moreover, the lungs represent an extremely effective and rapid means of absorption of chemicals by the body, and a deposit of fine particles in the terminal alveoli of the lungs may cause problems entirely different from those associated with the skin.

Since the lung surface cannot be washed off (as can the skin) if the chemical gets into the lungs and is deposited there, it can no longer be removed. It is of course true that bronchia are equipped with a defense mechanism, but this is only effective when the foreign substance has reached the alveoli (from which they are removed only by absorption or enzymatic dissolution). If such a dissolution is not possible, such a condition as silicosis of the lung is a possibility.

In 1958 Bergmann and his collaborators[10] reported two cases of lung irritation which they attributed to particles of hair sprays deposited in the lung tissue. In experiments with animals which had received subcutaneous injections of hair spray, they found granules in certain tissues which yielded a positive color reaction with periodic acid Schiff reagent. They assumed that these color-reactive deposits were macromolecular particles of hair spray.

Calandra and Kay [11] tested the possibility of lung effects by hair sprays (on guinea pigs and in inhalation tests examined two branded products and two sprays produced in their own laboratory). These tests furnished no proof of the deposit of hair spray particles in the lungs, since granules susceptible to coloring with periodic acid Schiff reagent were also found in the lung tissues of untreated guinea pigs. However, one striking point uncovered was the large percentage of animals which caught pneumonia. This was presumed to have been caused by the repeated cooling off of the animals after having been exposed to aerosol propellant evaporation, since other animals repeatedly exposed to cold air showed the same frequency for pneumonia.

Since there was a chance that hair sprays in fact did constitute a risk to the public, the matter came under the attention of the U. S. Food and Drug Administration. FDA researchers Draize and his collaborators[12] submitted six different hair sprays to a most intensive inhalation test. The authors examined sprays whose film-forming components belonged to the following chemical types: 1. polyvinyl pyrrolidone, 2. a copolymer from polyvinyl pyrrolidone and polyvinyl acetate, 3. shellac, 4. dimethyl hydantoin formaldehyde resin, 5. lanolin, and 6. modified poly acrylic acid resin.

At the beginning they ascertained that the normal spray time is 10 seconds, and the normal interval for a human in an atmosphere saturated with hair spray is five minutes. On an average, a test human exposed for five minutes to air saturated with an aerosol inhaled 28 liters of air. After these preliminary findings, the test was pursued with rabbits, mainly because rabbits are less susceptible than guinea pigs to the cooling effects of the aerosol. The animals were exposed in an acute inhalation test for 30 seconds at a time, which was repeated every half hour for a total number of 10 exposures. In a test lasting 90 days the animals were exposed to an aerosol spray twice daily for 30 seconds each and remained 15 minutes in the aerosol "atmosphere." The lungs of each animal (both those used in the acute and those in the 90-day test) were examined by chemical analysis, autopsies and complete blood tests were performed, and complete histopathological examinations were completed. The authors were unable to ascertain any alterations of the lung tissue, and came to the conclusion that aerosol hair sprays (in those compositions tested) do not hold any danger for the consumer in normal use.

The general directives published by the Food and Drug Administration for the examination of chemicals employed in foods, pharmaceuticals, and cosmetics urgently recommend the testing of aerosols, and not only by the inhalation test. The publication states that in addition to possible injury to skin and mucous mem-

(*Continued on Page* 81)

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AEROSOLS in review

A summary of aerosol articles in other publications

Aerosol Particle Retention is Subject of Article

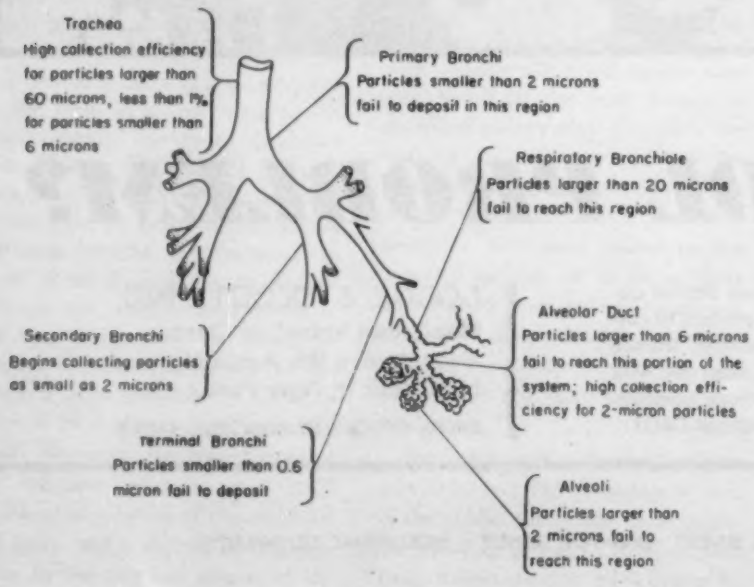
A HIGHLY significant area of research for the developer of internally-taken pressurized pharmaceuticals is the subject of a comprehensive article in the Nov. 1960 issue of *The American Review of Respiratory Diseases*. Called "Retention of Aerosol Particles in the Respiratory Tract," it was written earlier last year by R. I. Mitchell of the Battelle Memorial Institute, Columbus, O.

The author points out that particles are deposited in the respiratory tract by one of the following three mechanisms:

Inertial impaction: A particle suspended in an air stream is not able to follow the stream because of its inertia as it moves through the passages of the respiratory tract and is deposited against the walls of the passage. Inertial impaction is an important mechanism in the nasal airways and in the upper lung, where the air velocity is fairly high. Landahl and Herrmann, May and Rosin and co-workers have studied the deposition of particles in curved tubes and have shown that the larger particles are likely to be separated by this mechanism. The inertial effect of the particles is directly proportional to the density and to the square of the particle diameter.

Sedimentation: Because of gravitational effects, a particle will settle downward. This mechanism is one of the more important causes of deposition of larger particles in the deeper portion of the lungs, where the air velocity has been reduced. The sedimentation rate is proportional to the density and to the square of the particle diameter; therefore, the more massive particles that have survived the inertial influenced in the upper respiratory tract will be deposited by sedimentation. The settling rate for small particles can be calculated from Stokes Law.

Brownian motion: In the alveolar sacs, in which the air velocity is low, Brownian motion becomes an important mechanism in the removal of particulate matter. Very small particles suspended in air are in continuous motion because of being bombarded by air molecules. The mean displacement after a given time can be computed from Einstein's diffusion equation. From this equation, it is then possible to calculate the rate of removal of particles by diffusion.


Trachea
High collection efficiency for particles larger than 60 microns, less than 1% for particles smaller than 6 microns
Primary Bronchi
Particles smaller than 2 microns fail to deposit in this region
Respiratory Bronchiole
Particles larger than 20 microns fail to reach this region
Alveolar Duct
Particles larger than 6 microns fail to reach this portion of the system; high collection efficiency for 2-micron particles
Secondary Bronchi
Begins collecting particles as small as 2 microns
Terminal Bronchi
Particles smaller than 0.6 micron fail to deposit
Alveoli
Particles larger than 2 microns fail to reach this region

Since the article is largely a review of existing literature on the subject, most of the text is concerned with the mechanics of such measurements. However, the sketch below, "a schematic representation of the anatomy of the pulmonary tree showing theoretic retention computed by Landahl," could be extremely helpful to the pharmaceutical developer.

•

AN EXCELLENT discussion of what types of aerosol paints are available to the homeowner is the gist of an article in the "Home Improvement" section of The New York Times for Sunday, March 12. Written by Bernard Gladstone, the article talks about high-gloss enamels, metallic colors, clear varnishes, shellacs, rust preventives, hammer-tone finishes, multicolor paints, and special effects created with combinations of spray paints.

Of special interest to marketers of aerosol paints are Mr. Gladstone's instructions on how best results can be obtained with these products:

(1) Always make certain you shake the can vigorously for several minutes before starting to use it. Most have a built-in agitator which sounds like a ball rattling around on the inside when you shake them.

(2) Never spray in a cold room, and never use a spray bomb which has been standing in the cold. For best results work should be done at room temperature (approximately 70°).

3) To be assured of a smooth, even coating, always move the can so that it is at a uniform distance from the work at all times. Avoid "arcing" or swinging the arm so

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- Now available in 12- and 16-oz. sizes, as well as the popular 6-oz. size!

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Canco "SNAP-LOCK"* Pressure Cans, teamed with single-shell overcaps** and tamperproof plastic bands, are winning new sales successes every day! Ask your Canco salesman to show you Canco's "SNAP-LOCK" Pressure Can . . . and put this winning team to work for you!

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*Patent applied for. **Single-shell overcaps available from a choice of manufacturers, who produce caps especially designed to fit Canco's "SNAP-LOCK" Pressure Cans.

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that the nozzle is closer to the work at the center of the stroke and farther away at each end. In most cases, eight to ten inches will be about the right distance (a greater distance is required for effective multicolor or spatterdash applications).

(4) Spray paints should never be applied too heavily. Best results will always be achieved if two light coats are applied rather than one heavy coat.

(5) Never stop moving the can while your finger is depressing the spray button. Keep it moving steadily at all times to prevent paint piling up and causing runs or sags—especially in corners and along edges.

•

POSSIBLY the most valuable regular article about British aerosol products is the "Aerosol Review" published in the February issue of *Chemical Products*, the "journal for manufacturing chemists." Taking the leading British aerosol product types, the article breaks down each product according to name, company, purpose, active ingredients, propellant, container, and valve. Product categories include insecticides (15 products), household products (37), weedkillers (7), cosmetics (20), medical products (8), veterinary products (5), and industrial products (19).

Among the more interesting of the newer products to be listed is "Regen" vitamin syrup for young livestock, marketed by Walter Gregory & Co., Ltd., probably the leading marketer of veterinary products. Mixed among the cosmetic products are eight hair sprays.

•

"AEROSOLS are a form of packaging no manufacturer of packaged goods can ignore and it is equally obvious that no manufacturer can afford to leap into aerosol packaging without a full exploration of the field." This pithy statement is one of the highlights of a good article on aerosols by R. J. Layet, manager of the Aerosol Valve Division of National Radiators (Manufacturing) Pty. Ltd. in the January issue of *Australian Packaging*. Mr. Layet points out that "better and cheaper aerosol valves, low cost containers, lower priced propellants, are allowing along-the-line reductions in prices of present products, permitting them to reach larger sections of our community."

Mr. Layet repeats the now generally recognized aerosol maxim that the marketer should not rely on the mere "novelty" appeal of the aerosol to sell the product, but should make sure it offers real advantages over other packaging forms.

89% of Drug Stores Now Use Self-Service Merchandising

NINE out of ten drug stores offer some degree of self-service, reported the tenth annual survey of *American Druggist* on Feb. 20. This self-service ranges from one to two departments to self-service throughout the store—except of course, for the prescription and soda fountain departments. This point is regarded as highly significant among the marketers of aerosol cosmetics and pharmaceuticals (and certain insecticides) because it means that all but strictly prescription items will have to be designed with a view toward consumer eye appeal.

The growth in self-service in drug stores almost parallels that of food stores, where supermarkets have largely superceded clerk-operated stores in all the metropolitan areas in the country. *American Druggist* points out that this trend has continued to be strong "despite the fact that certain aspects of retail pharmacy operation can never be made compatible with self-service, and despite the fear that self-service might, if mishandled, detract from the professional atmosphere that must always prevail in a retail pharmacy."

As of early 1961, the trade magazine suggests, the following situation prevailed:

"1. 40.1% of all U. S. drug stores are largely self-service, meeting this definition: 'A self-service drug store is one in which 50% or more of the selling area is devoted to merchandise displayed on fixtures which are completely accessible to customers.'

"2. 49.2% are partly self-service. In these stores, the merchandise in one or more major departments is completely accessible to customers, but such departments account for less than half the store's selling area.

"3. 10.7% are run on a fully clerk-service basis, with practically no merchandise accessible to the customer."

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Can Mfrs. Elect New Slate

The Can Manufacturers Institute last month elected a new slate of officers and board of governors. Reuben L. Perin, of the Continental Can Co. was elected president and Ralph C. Rosecrance, of J. L. Clark Manufacturing Co., was elected vice-president. Elected to the board of directors, in addition to Messrs. Perin and Rosecrance, were:

Otto J. Blank, R. M. Hollingshead Corp.; General Lucius D. Clay, Continental Can Co.; John F. Connelly, Crown Cork & Seal Co.; George W. Crabtree, Campbell Soup Co.; George W. Davidson, Federal Tin Co.; Thomas C. Fogarty, Continental Can; L. E. Hall, California Packing Corp.; Albert E. Heekin, Jr., The Heekin Can Co.; Roger F. Hepenstal, American Can Co.; Earl W. Hosler, Buckeye Stamping Co.; Douglas Huether, Independent Can Co.; James R. McCuskey, Central States Can Corp.; Joseph E. Macry, Empire Can Corp.; William F. May, American Can; William J. Milton, George A. Milton Can Co.; Winslow H. Parker, The Parker Metal Decorating Co.; Robert S. Solinsky, National Can Corp.; David Stern, Stern Can Co.; William C. Stolk, American Can; Thomas T. Taylor, George D. Ellis & Sons; Samuel V. Tuttas, Crown Cork & Seal; S. M. Hopkins, National Can; and George A. Milton (honorary), George A. Milton Can Co.

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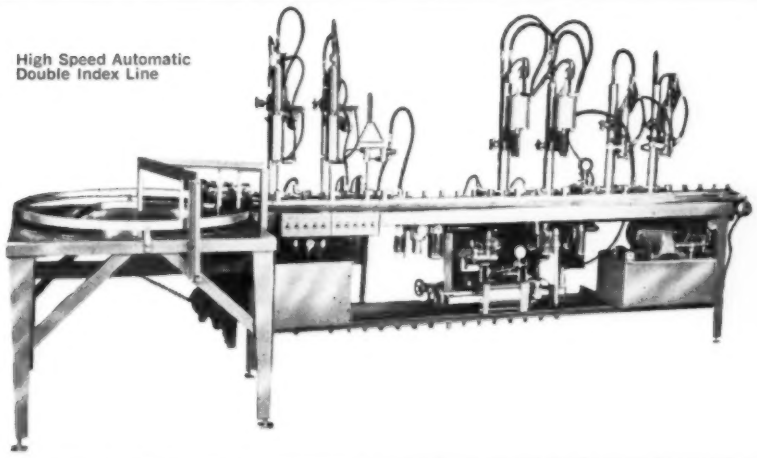

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news of pressurized packaging

Heffron Joins Puritan

The appointment of William Heffron, Jr. as plant manager has been announced by Puritan Aerosol Corp. Boston custom filler. He is the newest member of a management team, averaging just 35 years in age, which is credited with a 300% increase in filling volume by the company in the past year.

Mr. Heffron was formerly in charge of Revlon's Aerosol Filling Division. Before that he was also associated with C. Barr & Co. as a plant superintendent, and Castor Oil Products as plant manager. He is a graduate of Pratt Institute, and also attended the New York University School of Engineering.

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Lederle Names Piercy

Charles K. Piercy has been named director of marketing at the Lederle Laboratories Division of American Cyanamid Co., Pearl River, N. Y. He succeeds Harry W. McNey, a 20-year veteran of the company, who left Lederle to become executive vice-president of McNeil Laboratories. Mr. Piercy had been sales manager at Lederle since 1954.

•

Fath to Sell Products in U. S.

Les Parfums Jacques Fath, Paris, France, has just introduced its line of aerosol and non aerosol fragrance products into the U.S. market. The line includes four scents, "Canasta," "Fath de Fath," "Fath's Love," and "Green Water," all of which are bottled, packaged, and sealed in Paris.

"Canasta," "Fath de Fath" and "Green Water" will be available in parfum de toilette aerosol form, with "Fath's Love" to be offered only in a one-ounce perfume unit at present. The products will be handled by the New York office at 5 East 57th Street. Nicholas Baker has been appointed to administer the office, with William F. Donegan as Midwest sales manager, and William H. Russell as representative in the six eastern states.

•

N-G Sues Aerosol Research

Newman-Green, Inc., Chicago, has sued Aerosol Research Co. of Chicago, by way of counterclaim, for infringement of Green patent No. 2,777,735. The Green patent has to do with a valve construction in which the lower end of the removable stem is longitudinally slitted. The suit, which is pending in the United States District Court in Chicago is for both injunctive relief against further infringement and for damages for past infringement.

•

Explosives Bureau Announces Fee

The Bureau of Explosives of the Association of American Railroads, 63 Vesey Street, New York 7, N. Y., has announced that it will henceforth charge a fee of $4 for each sample aerosol examined by the bureau's laboratory. The fee was necessary, according to T. C. George, chief inspector, to partly defray the cost of operating the laboratory.

•

German Assn. Names Manager

Interessen-Gemeinschaft Aerosole, the German Aerosol Association, has announced the election of F. Nowak as secretary-manager. Mr. Nowak will conduct the affairs of the association from I. Hse. Chemieverband e.v., Karlstrasse 21, Frankfurt/Main, Germany. The post of part-time secretary-manager had been vacant since the resignation of F. H. Hans, of Pegasus International Corp. last spring.

Aerocide Dispensers Names Two

Aerocide Dispensers, Ltd., Rexdale, Toronto, a major Canadian custom aerosol packager, last month announced the appointment of Kenneth G. Mitchell as executive vice-president and of Ralph R. Legate as director of sales.

Mitchell Legate

Mr. Mitchell had been the company's operations manager. Mr. Legate had been with Precision Valve Corp., Yonkers, N. Y. as sales manager for all Canada and parts of the U. S. According to Carl D. Durant, Aerocide president, the two appointments are in line with the company's recently expanded production facilities.

•

Burnham to L&F Post

Stanley W. Burham, director of purchases and package engineering for Lehn & Fink Products Corp., New York, has been promoted to the newly-established post of manager of marketing development. In his new post he will be responsible for the investigation of acquisition opportunities, the coordination of creative packaging activities and market planning.

•

Angelique Names Ad Agency

Angelique & Co., Inc., Wilton, Conn., last month named Wilson, Haight & Welch, Hartford, Conn., to handle its advertising. Angelique is a marketer of aerosol perfumes, colognes, and other cosmetics.

Risdon Elevates Five Officers

The Risdon Manufacturing Co., Naugatuck, Conn., manufacturer of aerosol valves and cosmetic and aero-

Lewis A. Dibble, Jr.

sol containers, has promoted five officers and elected two new directors in a move to consolidate its top management team. Heading the list of appointments is Lewis A. Dibble, a Risdon executive for 47 years and its president for 33, who was named chairman of the board and chief executive officer. Succeeding him as president is his son, Lewis A. Dibble, Jr., executive vice-president, who has been with the company for 15 years.

Other new officers elected were Harold W. Turnblom, former assistant treasurer, who was named treasurer; and Roger C. Goodeve, assistant secretary, who was named secretary. Both positions were held for more than 20 years by Harold P. Baldwin, who retired but who will continue as a director of the firm. Carroll E. Retallick becomes assistant treasurer. Newly elected directors are Donald W. Henry, attorney with the Waterbury firm of Gager & Henry; and Edward G. R. Whitcraft, New York investment counselor associated with Clark Dodge & Co.

The senior Mr. Dibble joined Risdon in 1913 as general manager and director and became president in 1927. He also has been active in the management of the Eastern Malleable Iron Co., Naugatuck, and is currently board chairman and chief executive officer of that company.

Risdon's new president, a graduate of the Sheffield Scientific School at Yale University, joined the company in 1946. He began as a management trainee, then served as inter-plant engineer, assistant factory manager, administrative vice-president, and executive vice-president.

•

Europeans Move to Set Rules

Government authorities in Switzerland and West Germany recently indicated that regulations governing the packaging of aerosol containers would soon be forthcoming. In Switzerland, the Interstate Poison Commission, working with the International Aerosol Association, observed the use of various flammable propellants in aerosol packages. At the conclusion of a number of flammability tests for vinyl chloride, methylene chloride, chlorothene, butane, and propane, the Commission indicated that it would soon issue safety regulations governing the use of these materials in pressurized cans.

In Germany, the German Compressed Gas Commission announced plans to deliberate on national regulations pertaining to the production and filling of pressurized containers. A complete text of proposed regulations has been submitted to the German Aerosol Association (Interessen-Gemeinschaft Aerosole) in order to give that group a chance to submit recommended changes, objections, and deletions.

•

McDonald to Colton Post

Lawrence A. McDonald has been named general sales manager of Arthur Colton Co., Detroit, manufacturer of filling and packaging machines for the pharmaceutical, chemical and food industries. Former vice-president and general manager of the Super Tool Co., Mr. McDonald is a mechanical engineering graduate of Detroit Institute of Technology. Prior to joining Super Tool in 1957, he was a sales engineer for Whitman & Barnes, and before that was a process engineer with Drive-All Manufacturing Co.

Janovsky Joins Florasynth

Harold J. Janovsky, former head of the flavor laboratories of Fritzsche Brothers, Inc., New York, has joined the executive staff of Florasynth Laboratories, Inc., New York manufacturer of aromatic chemicals and perfuming materials. He has been appointed to the newly created position of technical director, a post necessitated by the expansion of the company's operational activities, introduction of new products, and accelerated programs in research and development.

Mr. Janovsky is a veteran of 27 years in the flavor, essential oil, technical specialties, and other allied industries. He is known for his technical articles in flavor and food publications and for his work in the Flavoring Extract Manufacturers Association and the Fruit and Syrup Manufacturers Association.

•

Kintner Joins Law Firm

Earl W. Kintner, who has been chairman of the Federal Trade Commission, last month announced plans to join the law firm of Berge, Fox, and Arent, of Washington, D. C. He will take over supervision of the firm's antitrust and trade regulation work.

Under Mr. Kintner's direction, the FTC became very vigorous in the field of law enforcement. During the past two years, for instance, several aerosol marketers were cited by the FTC for improper and misleading television advertising.

•

Montana Voids Fair Trade Law

Montana last month became the 18th state to lose its fair trade law in its state supreme court. In a case pending since 1959, the Montana Supreme Court ruled the state's 1947 fair trade statute invalid on constitutional grounds. Specifically, the law was judged to violate the anti-price fixing provisions in the state constitution.

The decision stems from a lawsuit brought by Union Carbide, manufacturer of "Prestone" anti-freeze, against Skaggs Drug Center, a Utah chain which operates three stores in Montana. Skaggs was accused of selling the product 76 cents below the fair trade minimum of $3.25 a gallon.

Now you can tamperproof your aerosol container with a Du Pont "Cel-O-Seal" Band

Here are the important advantages this new sealed container provides:

- Ends casual sampling, cap switching and in-store damage.
- Protects product quality and full content from packaging line to consumer.
- Builds consumer and retailer confidence.
- Helps get your food, drug and household products into more self-service stores.
- Cuts costs. Newly designed single-shell cap, plus "Cel-O-Seal" band, costs less in most cases than old-style, unprotected double-shell cap.
- Gives extra labeling space.
- Has design flexibility. "Cel-O-Seal" band can be printed in one or a combination of eye-catching colors to complement your package design.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

CEL-O-SEAL BANDS
REG. U. S. PAT. OFF.

MAIL COUPON TODAY FOR FULL FACTS!

E. I. du Pont de Nemours & Co. (Inc.)
"Cel-O-Seal" Div. AA
River Road, Buffalo 7, N. Y.

Please have a Du Pont "Cel-O-Seal" representative contact me.

Name_____

Title_____

Firm_____

City_____ State_____

SCC Lists Meeting Program

The Semi-Annual Spring Meeting of the Society of Cosmetic Chemists will be held at the Hotel Biltmore, in New York, on May 12. Morris J. Root, program chairman, has announced the following papers for the meeting:

Constribution of the Chemical Engineer to the Cosmetic Industry

Contribution of the Organic Chemist to the Cosmetic Industry

Contribution of the Analytical Chemist to the Cosmetic Industry

Physical and Chemical Properties of Shellac and its Derivatives

Contribution of the Pharmaceutical Chemist to the Cosmetic Industry

Contribution of the Inorganic Chemist to the Cosmetic Industry

Contribution of the Physical Chemist to the Cosmetic Industry

Contribution of the Biological Chemist to the Cosmetic Industry

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Jewel Tea Buys Drug Co.

Jewel Tea Co., Chicago, major food chain with its own line of aerosol products, has acquired the 28-unit Osco drug chain for $13.5 million, the company announced last month. The purchase, made to "achieve product diversification to broaden the area of its merchandising activities" involved an exchange of 260,000 shares of stock.

Osco currently operates in Waukegan, Joliet, and Rockford, all suburbs of Chicago, but under its new management will probably "invade" the Chicago area. An Osco spokesman said that new locations will be in connection with Jewel stores and will also be free standing. Osco president Paul Stratton has been elected a Jewel Tea director, and C. T. Allen, Jr., Osco secretary, and George Hilden, treasurer, will continue to occupy the same posts.

•

Druk Pak Moves Offices

Druk Pak, Inc., international supplier of aerosol laboratory and production equipment, has moved its offices to 8 Limmatquai/Rossligassi, Zurich 1, Switzerland. The company is the sales representative for Johann Waldherr, Mannheim, Germany, manufacturer of the equipment.

Rexall Borrows $35 Million

Rexall Drug and Chemical Co., Los Angeles, last month announced completion of arrangements for direct placement by the company of $35 million in notes, due 1982, with a group of major insurance companies. Proceeds from the notes will be used to help finance Rexall's participation in a joint petrochemical venture now being undertaken by that company and El Paso Natural Gas Products Co. The two companies will construct a plant at Odessa, Tex., for production of olefins, polyolefins, and other chemicals.

MM&R Formulates '61 Plans at Annual Sales Meeting

Magnus, Mabee & Reynard, Inc., New York essential oils firm, held a three-day sales and technical conference at the Warwick Hotel, New York, Feb. 9-11. Sales plans for the coming year were reviewed. Standing in the back row of the photograph are (from left): George H. McGlynn, vice-president and treasurer; Robert B. Magnus, Jr., assistant treasurer; Percy C. Magnus, president; Bernard Jeffs, director of advertising; Shockley C. Gamage, assistant to the president; Joseph Baird Magnus, executive vice-president; and Robert B. Magnus, Jr., executive vice-president. Mr. Jeffs and Robert B. Magnus, Jr. acted as co-chairmen for the technical and sales session.

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CRIMPERS
REQUIREMENT
Automatic Crimper
High Speed
Rotary Crimper
Laboratory Crimper
Non-Vacuum and Vacuum Models
Write for free catalog describing our aerosol equipment. Pressurized food lines, fillers, crimpers, gassers and shakers—valve feeders — ball droppers — water baths — code daters. Special machinery designed and built.
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Vacuum Crimper

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AEROSOL
TECHNIQUES
INCORPORATED

Private label manufacturing, research and development of aerosol cosmetics, pharmaceuticals, industrial and chemical specialties

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If you'd like to know about the marketability and technical story of aerosol packaging for your product, ask **ATI.**

make things move with aerosols

'Arcton' goes almost everywhere. It's not only Britain's best-selling aerosol propellent, but the choice of aerosol fillers in Continental Europe and as far afield as South America, India, South Africa, Hong Kong, Australia and New Zealand. The reason is simple: for high quality and uniform performance the 'Arcton' range is unbeaten. There's an 'Arcton' chlorofluorohydrocarbon propellent for every need. Literature and further information are available on request.

ICI
GENERAL CHEMICALS DIVISION

Arcton PROPELLENTS

Imperial Chemical Industries Limited
London
England

AR.578

Contact your nearest agent for further information about 'Arcton' chlorofluorohydrocarbons.

AUSTRALIA
I.C.I. of A. & N. Z. Ltd., P.O. Box 1911, Melbourne, C.2.

BELGIUM
I.C.I. (Belgium) S.A., 32 Rue Edmond Tollenaere, Brussels, 2.

CHILE
Cia Imperial de Industrias Quimicas de Chile S.A. Com. e Ind., Casilla 1357, Santiago.

COLOMBIA
John Simon & Cia. Limitada, Calle 14 No. 12-50, Oficina 813, Bogota.
Rodrigo Agudelo G. Edif. Garces, Avenida Colombia Calle 11, Oficina No. 303, Cali.
Walter Bridge & Co. Ltd., Edificio "Jenaro Gutierrez", Calle Colombia No. 47-28, Medellin.
Tracey & Companie S.A., Carrera 44, No. 36-29, Barranquilla.

GHANA
I.C.I. (Export) Ltd., P.O. Box 104, Tema.

HOLLAND
I.C.I. (Holland) N.V., Postbus 551, Rotterdam.

HONG KONG
I.C.I. (China) Ltd., P.O. Box 197.

INDIA
I.C.I. (India) Private Ltd., P.O. Box 192, Calcutta 1, India.

ITALY
Beghe & Chiapella, Via Isonzo 25, Milan.

MALAYA
I.C.I. (Malaya) Ltd., P.O. Box 284, Kuala Lumpur.

MEXICO
I.C.I. (Export) Ltd., San Lorenzo 1009, Esq. Av. Universidad, Mexico 12. D.F.

NEW ZEALAND
I.C.I. (N.Z.) Ltd., P.O. Box 1580, Wellington, C.1.

PAKISTAN
I.C.I. (Pakistan) Ltd., P.O. Box 4731, Karachi-2.

PANAMA
Agencias W. H. Doel S.A., Apartado 322, 29-15 Avenida 11.

PERU
Imperial Chemical Industries S.A. Peruana Com. e Ind., Casilla 1668, Lima.

PHILIPPINES
Wise & Co. Inc., P.O. Box 488, Manila.

SOUTH AFRICA
I.C.I. (South Africa) Ltd., P.O. Box 11270, Johannesburg.

SPAIN
Sociedad Anonima Azamon, Apartado 711, Paseo de la Castellana No. 20, Madrid, 1.

SWEDEN
Holger Andreason, A/B, Storgatan 7, Orebro.

URUGUAY
Industrias Quimicas Uruguayas "Duperial", Avda. General Rondeau 2050, Montevideo.

VENEZUELA
H. Kern & Co., S.A., Apartado 1987, Edificio Kerr, Av. Pral. Los Cortijos de Lourdes, Caracas.

ICI GENERAL CHEMICALS DIVISION

Givaudan-Delawanna Holds Four-Day Sales Meeting

A four-day sales meeting, held in New York Feb. 14-17, brought together all U. S. and Canadian sales personnel of Givaudan-Delawanna, Inc. and its associate companies, Givaudan Flavors, Inc. and Sindar Corp. R. E. Horsey, vice-president in charge of sales, presided over the meeting, which included an all-day visit to the company's plant at Delawanna, N. J. On this visit members of the analytical research, production, and other departments demonstrated new techniques and the modern production facilities. Also included was a tour of the New York perfume laboratories, at which problems in perfuming aerosols, cosmetics, and specialty products were reviewed.

Mich. State Plans Exposition

The School of Packaging of Michigan State University, East Lansing, Mich. will hold its third annual Packaging Exposition May 12-13. The exposition will concentrate on interesting new students in the packaging profession, relating packaging to industry, and pointing out to the public the need for progressive packaging.

The course of study, use of various packaging materials, tests of materials, and some special individual projects will be used to show the work being done by the students. Graduate students, doing their master theses, will display and explain their research projects. Michigan State is the only university in the country offering a four-year undergraduate curriculum in packaging, and the school's facilities include an aerosol laboratory.

This year's exposition is expected to attract some 1000 people, about 10% of whom will be from the packaging industry. The rest will consist of students, faculty members, and parents.

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List Plans For Garden Show

With the moving of the National Hardware Show to McCormick Place in Chicago, Oct. 2-6, for 1961, an eastern lawn and garden supply trade show will be held in New York, according to Frank M. Yeager, managing director of both shows. The Eastern Lawn Garden and Allied Products Trade Show will be held at the Coliseum, Oct. 20-22, Mr. Yeager said.

"Lawn and garden equipment manufacturers, distributors and others in expressing the need for a show in the East, emphasized the size of the market, pointing out that nearly 30% of the nation's population lives within 350 miles of New York City."

Floor plans and complete exhibitor information may be obtained by writing Eastern Lawn, Garden and Allied Products Trade Show, Suite 1103, 331 Madison Ave., New York 17, N. Y.

Scovill Expands Int. Staff

Russell C. Flood has been named general manager of Schrader-Scovill International Division, which was formed recently to coordinate all overseas manufacturing and marketing operations of Scovill Manufacturing Co. Mr. Flood, a vice-president of Scovill, formerly was general manager of the company's Schrader division.

Other management appointments to the International Division were made to facilitate Scovill's overseas market and product expansion and diversification program. Frederik R. Starr, former Schrader Division planning manager, was named administrative manager and Frank Fernandez, former marketing director of Valvulas Schrader do Brasil, was appointed technical manager.

Mr. Flood joined Schrader in 1930 and has served in financial and planning positions. In 1954 he has been assigned the job of trouble-shooting difficulties that arose in Schrader's

Starr Fernandez Flood

entry into manufacture in Brazil. Early last year he made a two-month, world-circling tour of the company's foreign manufacturing facilities to evaluate the growth demands in each important marketing area.

Mr. Starr joined Schrader in 1946 as assistant to the comptroller and became planning manager of the division in 1949. A former financial analyst, he is a graduate of Princeton University (BA, '38) and Harvard Graduate School of Business (MBA, '40).

A licensed marine and diesel engineer, Frank Fernandez joined the Schrader division in 1938 and has held positions ranging from machinist to process engineer. In 1944, he was graduated from the U.S. Merchant Marine Academy at Kings Point, N. Y. Since 1955, Mr. Fernandez has resided in Sao Paulo, Brazil as managing director of the company's Brazilian manufacturing subsidiary.

•

Colgate Appoints Farrar

The appointment of Dr. Richard E. Farrar to the newly-created position of manager-research coordination, has been announced by the Colgate-Palmolive Company's Household Products Division, New York. He previously was manager of the liquid products area in the Household Products Division's Research Department. In his new post he will be responsible for coordination between the Household Products Division and the Research and Development Department of technical matters pertaining to the research and development, and marketing, of present and contemplated household products.

Dr. Farrar began his career with the Research and Development Department of the company in 1951 as a senior project chemical engineer. In the ensuing years, he was appointed to supervisory positions of increasing importance. He was named manager of the bar products area in 1957, a post he held until September of last year when he became manager of the liquid products area. A graduate of Virginia Polytechnic Institute with a B.S. degree in chemical engineering, Dr. Farrar received his M.S. and Doctoral degrees in the same field from The Johns Hopkins University.

•

Getman Richardson-Merrell VP

Frank N. Getman has been appointed executive vice-president of Richardson-Merrell, Inc., New York (formerly Vick Chemical Co.). He will continue as president and general manager of Wm. S. Merrell Co., Cincinnati. Succeeding him as president and general ganager of the Hess & Clark Division of the company, Ashland, O., is Dr. Aaron L. Andrews.

INTRODUCING,

The BRAND NEW, Inexpensive "PRINCESS" line of SELF CONTAINED AEROSOLS with the Refillable Look

16cc Straight Wall or Flair Caps

22cc Flair or Straight Wall Caps

1¼ oz. Straight Wall or Flair Caps

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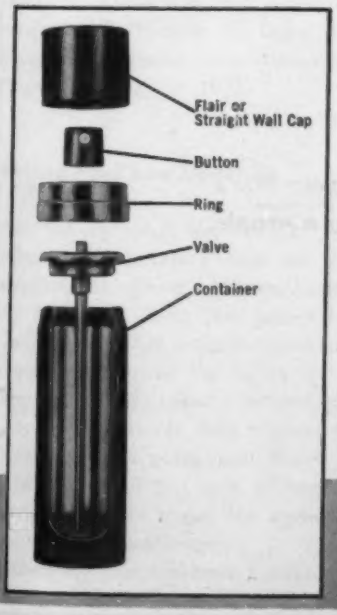

Now, METAL FAB brings you an easy-to-assemble 5 part unit in 4 popular container sizes; 2 stock design caps—flair or straight wall—that resemble more expensive refillable packages.

This new MF, low cost "PRINCESS" line:

LOOKS LIKE REFILLABLES . . . *BUT ARE NOT!*
LOOKS EXPENSIVE . . . *BUT ARE NOT!*
LOOKS DIFFICULT TO ASSEMBLE . . . *BUT ARE NOT!*
LOOKS COSTLY TO FINISH AND DECORATE . . . *BUT ARE NOT!*
LOOKS LIKE THEY REQUIRE INNER CONTAINERS . . . *BUT DO NOT!*
LOOKS LIKE THEY NEED SPECIAL VALVES . . . *BUT DO NOT!*

Yes, these brand new MF 'exclusives' look identical to refillable packages requiring inner containers. That is where the resemblance ends!

Designed for cosmetics, perfumes and personalized sprays, made with the expensive look . . . limitless sales appeal. Designed to accommodate standard size mounting cups and metered or non-metered valves of your choice.

MF the new symbol of quality, offers you a complete package service: design, fabrication, decoration, finish, caps, bottle closures, flaconetts, perfume funnels, etc.

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Most aerosol perfume compounds are suitable for a very limited number of end products. Here, however, is one almost universally suitable:

Bouquet for Aerosol S7746
$7.00 lb.
A fresh light fragrance with citrus overtones

Excellent in

Room sprays
Hair sprays
Personal deodorants
Suntan preparations
Shaving cream
Colognes

Write us on your firm's letterhead for a sample.

schimmel

newburgh, new york

Gen. Chem. Appoints Rayner

The appointment of George C. Rayner as assistant to the president of Allied Chemical's General Chemical Division has been announced by Frank J. French, president. Mr. Rayner, with the division 30 years, will direct special projects which will include economic reports and the coordination of proposals for government and industrial contracts. He will also continue to supervise the division's safety program.

A general administrative consultant for the past 10 years, Mr. Rayner earlier served as auditor and assistant auditor. He is a graduate of Pace Institute in New York City and a Certified Public Accountant.

General Chemical, with 40 plants across the country, is a leading producer of sulfuric acid and other basic industrial chemicals, fluorine chemicals for atomic energy and the space age, refrigerants and aerosol propellants, high purity laboratory and scientific chemicals, and agricultural chemicals.

•

Hightower to Geigy Sales

William Hightower has been appointed to the South Central District field sales staff of Geigy Agricultural Chemicals Division of Geigy Chemical Corp., Ardsley, N. Y. He comes to Geigy from the technical sales department of Velsicol Chemical Corp., where his territory was Mississippi and Tennessee. Previously he had been with the Black Leaf Division of Diamond Alkali Co. and with the Agricultural Division of Delta Air Lines. He graduated from Mississippi State University in 1952.

•

Extend Food Law Deadline

The Food and Drug Administration has extended the deadline for submitting laboratory tests on the acceptability of food additives. Under the Food and Drug Act passed by Congress in 1958, manufacturers are required to prove the safety of a long list of new substances used, or proposed for use, in food processing. They had been given until March 6 to submit proof that such substances were acceptable under the agency's definition of additives.

Recently Commissioner George P. Larrick asked Congress to extend the deadline because many manufacturers had not submitted such proof. He said that most of the delays were unavoidable and justified and that no useful purpose would be served in arbitrarily banning the use of many of the substances involved.

A bill to extend the deadline to June 30, 1964, cleared the House Commerce Committee on March 3. In the almost certain event that Congress could not complete action on the bill by March 6, the F. D. A. said it would disregard the deadline as long as the bill was under active consideration.

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LeMay Names JG Machine

LeMay Machine Co., St. Louis, Mo., has just appointed JG Machine Works, Inc., 14 Poplar Ave., Little Ferry, N. J. to be its Eastern sales agent. Both companies manufacture extensive lines of filling and gassing equipment for aerosol packaging. From its new quarters at Little Ferry, JG will step up its aerosol sales activities.

Maurice Maubert Is Dead

Maurice Maubert, 73, president-director-general of Societe P. Robertet et Cie., Grasse, France, international manufacturer of essential oils and aromatics, died on March 6 at the age of 73. A veteran of nearly 54 years with the company, which was founded by his great uncle in 1850, M. Maubert was named a Chevalier of the Legion of Honor in 1958.

He joined Robertet, then headed by his father, in 1905, and since that time has served in various administrative positions. One of his primary roles in the expansion of the company has been in the field of extraction research, in which he pioneered a number of improvements.

For the past few years he has assisted his two sons, Messrs. Jean and Paul Maubert, in the administration of the company. He was also a board member of the Federal Savings Bank in Grasse.

now a plastic starch for the aerosol market!

New from Polyvinyl Chemicals! NeoVac V21P synthetic polymer emulsion opens the growing spray starch market for plastics. This is a breakthrough that offers powerful consumer advantages over ordinary natural starches . . . lasts through 8 washes, is easy to apply, and in the long run costs Mrs. Housewife less. NeoVac V21P is non-yellowing and is stabilized to permit loading in aerosol cans.

Market NeoVac V21P plastic starch under your label! Want samples?

POLYVINYL CHEMICALS, INC.

26-15 Howley Street, Peabody, Massachusetts

equipment processes bulletins

Continental Announces "Nibbed Top" Cap Device

AFTER over a year of research and development work, Continental Can Co., New York, has developed a nibbed-dome top for aerosol cans to accommodate a single shell metal overcap. This less expensive overcap is said to serve as effectively as the present double shell overcap and to save packers as much as $4 per thousand on the 2⅛" diameter overcap and $6 per thousand on the 2 11/16" diameter overcap.

Some of the commercial methods so far employed to prevent actuation of the valve until the package is ready for use by the consumer have included: cellophane coverings over the valve, tin protective caps fitting to the one-inch valve cup by friction fit, plastic overcaps snapping onto the one-inch valve cup, metal and plastic overcaps snapping over the outside of the double seam, and a double shell metal cap with the outer shell fitting inside the double seam and the inner shell snapping over the one-inch valve cup, being held by friction.

For some years, Continental Can has supplied a dimpled-seam top with indentations on the inside of the top seam, into which a single shell cap snapped and was held by friction. While this worked satisfactorily, it was a difficult can to manufacture since the dimple had a tendency to disturb the seam, with the ever-present danger of leakage. In the new development, the dome-top of the aerosol can is impressed with *four dimple nibs*. When this new dome is seamed to the body of the can, the nibs provide a friction lock between the seam of the can and the nibs on the dome top. It is this lock which holds the inexpensive single-shell overcaps securely in place and permits handling of the filled package without overcap becoming loose.

The new method of preparing the dome to accept a single-shell overcap does not reduce the height of the can or cause filling problems. The dome may be lacquered inside with protective enamels for special products.

Continental reports that it will accept orders for the new nibbed-dome cans in both 202 and 211 diameter sizes. Single-shell overcaps are being offered by:

West Penn Manufacturing & Supply Corp.
809 Second Ave.
Brackenridge, Pa.

J. L. Clark Manufacturing Co.
Rockford, Ill.

Sterling Seal Corp.
Erie, Pa.

Ludwig Closures, Inc.
Brooklyn, N. Y.

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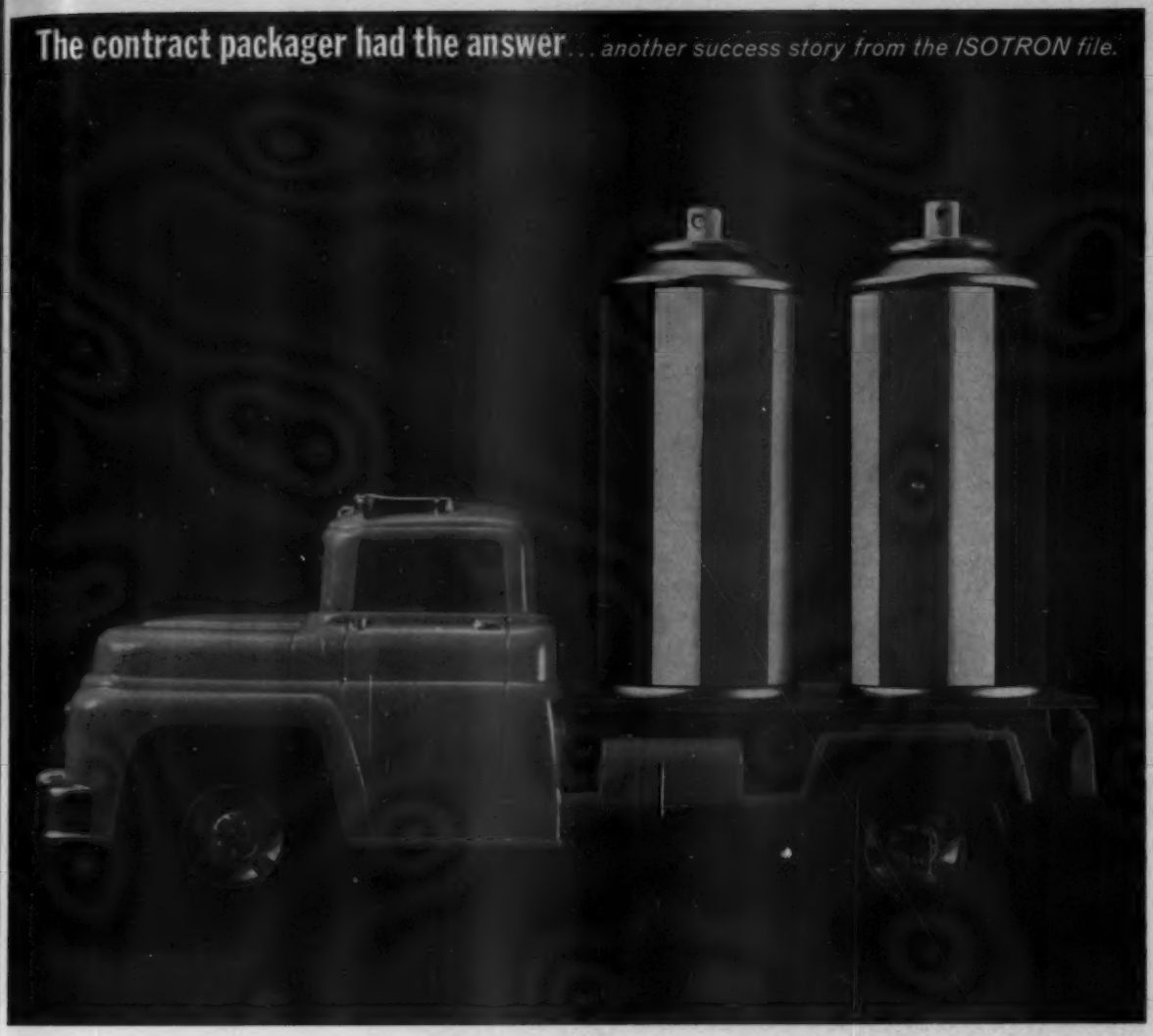
Clayton Valve Booklet

A new illustrated booklet has been prepared by the Clayton Corp., St. Louis, to assist marketers in the selection and specification of valve and cover assemblies for their product requirements. Illustrated and described are both spring and springless type nozzle down valves without dip tube, plus the dip tube foam valve with the "M 150" nozzle. Caps include screw-type, three-piece "dress-up," and snap-on cover. One page of the booklet gives valve component specifications for various product types.

Copies of the booklet are available by writing directly to the company at 4205 Forest Park Boulevard, St. Louis 8, Mo.



His aerosol service stops at your door

Forced to warehouse large aerosol orders against small, periodic shipments to customers? An ideal solution to your problem may be a note to American Aerosols, Inc., of Holland, Michigan. Service offered by this leading contract packager includes warehousing for customers and, on large orders, shipments in the firm's own trucks to your door.

Specialists in packaging aerosol paints, American Aerosols also handles a wide variety of industrial, chemical and household products—including decorative Christmas "snow". Two automatic filling lines, maintained by experienced personnel, offer fast trouble-free loading, while rigid quality-control procedures insure exact adherence to your specifications.

An expert packager can serve as your "good right arm" in preparing your product for the aerosol market. He can help reformulate it to meet the requirements of aerosol packaging. He can recommend the proper container, valve and propellent for your product. Increasingly, packagers specify ISOTRON®... the extra-pure, extra-dry propellents that are factory-sealed for your protection.

ISOTRON—*The Key to Modern Living*

Pennsalt Chemicals
ESTABLISHED 1850

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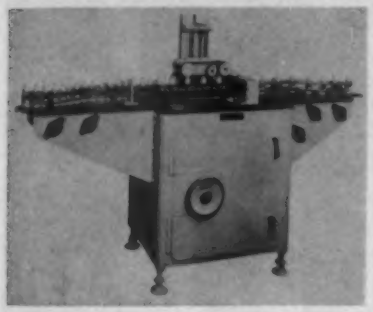
PENNSALT CHEMICALS CORPORATION
Three Penn Center
Philadelphia 2, Pa.

Nalbach Offers Code Dater

A new code dater which will handle metal, glass or plastic containers has been announced by John R.



Nalbach Engineering Co., 6140 Ogden Ave., Chicago 50, Ill. Called the "Model No. 2 S.L.L., it employs a readily removable printing wheel which is designed so that when replaced it will automatically index with the container conveyor.

Vinyl or rubber type is available and the inking rolls are designed to eliminate accumulation of ink. All main bearings in the base are greased by a one-shot oiling system and the machine is equipped with a handwheel so it may be operated independently of the drive.

•

Conveyor Automation Booklet

The Electronic Controls Division of Flo-Tronics, Inc., 712 West Ontario Ave., Minneapolis 3, Minn., has issued a new booklet outlining some of the possibilities of automating conveyor lines in packaging plants. The equipment illustrated includes an electronic dispatcher, a carton maker, a tally, readers, and coordinator, which can be used to dispatch and divert filled cartons anywhere along the conveyor line.

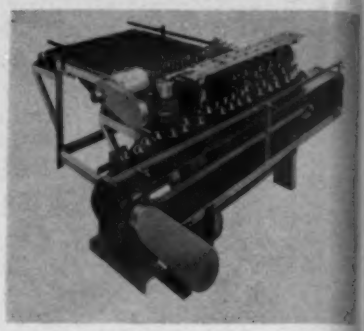
•

G. Barr Issues Booklet

G. Barr & Co., 3601 S. Racine Ave., Chicago 9, Ill., has just issued an eight-page illustrated booklet outlining the company's services, equipment, and background in the custom filling field. The company's services in counseling, formulation, and production are stressed. Copies of the booklet are available by writing directly to the company.

Single Container Filer

The Climax Products Division of Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio, has an-



nounced its "Unimatic" single filer, a unit designed to feed glass and metal containers onto a single file conveyor for feeding to a filling station. It handles up to 600 containers per minute with what is claimed to be a "gentle action which virtually eliminates breakage."

The machine incorporates a wire mesh infeed conveyor belt over which cases of empty containers are inverted. The belt moves the mass of containers onto a four-laned oscillating head which feeds a single file of containers onto the outfeed conveyor. The unit may also be used to unscramble filled packages, feeding to a packing machine. It is designed to handle various sizes of round containers. The discharge conveyor height is 37½ inches, compatible with standard conveyor lines.

•

New "Vancide" Bulletin

The R. T. Vanderbilt Co., specialties department, 230 Park Ave., New York, has announced publication of a new Technical Bulletin "Vancides —Properties and Uses".

"Vancide" products are bactericides-fungicides used in cosmetics, soaps, aerosols, housekeeping products, agriculture, textiles, and industrial applications.

The six page bulletin describes the properties and biological activity of these products. It also lists the uses and amounts of "Vancide" recommended for each use. Copies may be obtained by writing the company's specialties Department and requesting Bulletin 90.

Gilbert Unveils New Plastic Cap Line

IN WHAT is claimed to be an aerosol "first," Gilbert Plastics, Boright Ave., Kenilworth, N. J., has just introduced a new line of metallic-finish plastic aerosol overcaps. Available in silver, gold, bronze, and copper, the new caps are being fabricated in the small size or the full can diameter size. For the larger units, the company has stock molds for the "Snap-Lock" American Can container plus similar models which do not use the insert. The latter involve a snap action in which the outer bead covers the top bead of the can.

For the past six months, Gilbert has been hard at work developing the new caps and retooling its production line to handle the new process. First attempts were hampered by weld spots and bad dispersal of the pigment, but in the new production line the pigment is whirled as it is molded, thus mixing it thoroughly and allowing even color tone and distribution.

Making additional use of its six months' preparation period, Gilbert has developed a series of new molds with new styling and design. Now the unbreakable plastic stacking caps can be supplied in a wide variety of colors, including the metallics, with distinctive top-of-cap styling. The smaller caps feature a wide ribbed side decoration with a raised flat surface for ease in price marking.

The larger caps have already been adopted by Gillette (for its nationally-marketed "Right Guard" personal deodorant for men) and by Chesebrough-Pond's (for its "Pertussin" spray vaporizer). The "Right Guard" package, with its black overcap, won the award for "Other Personal Products" in the 1960 CSMA Aerosol Packaging Awards Contest.

The management of Gilbert Plastics is extremely optimistic about prospects for the new cap line, and has plans to capture a fair share of the market for this type of cap. They point out that the new process will result in a savings in cost over competing caps made of other materials. ★

•

Special Perfumes for Butane

A range of perfume oils to eliminate the smell of mercaptans in the use of butane/propane has been developed by Ets. De Trevise, Colombes, France. The perfumes are intended for use in insecticides, room deodorants, and other specialty and household products.

ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.

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Eriez offers you a wide choice of magnetic engineering services at your plant . . . services which are the result of our research, field testing, and product development programs.

A wealth of magnetic know-how is available from our full staff of engineers and research and development personnel continually working on new ideas, new designs, new products, new applications.

Eriez devotes a major share of its engineering time to solving customers' problems in 3 major fields:

1. Use of Permanent Magnets to solve problems of separation of tramp iron or fine ferrous contamination.
2. Magnamation® — the principles of permanent magnetism applied to automation, particularly pertaining to ferrous parts, cans, etc.
3. Vibration — both electro-permanent vibratory feeding of all types of bulk materials and in bin vibration.

Whether you're an equipment manufacturer or a direct user, our wealth of technical help is available to you. Write to Chief Engineer:

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Sales Manager

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16 NEW PRODUCTS IN THE LAST 5 YEARS

Aerosol Division Lists Program for CSMA Meeting

TECHNICAL PAPERS on aerosols will be featured by two divisions of the Chemical Specialties Manufacturers Association when the organization holds its mid-year meeting at the Drake Hotel, Chicago, May 15-17.

A special symposium on "Aerosol Insecticides Up to Date" will highlight the program of the Insecticide Division, acording to Mark L. Hill, Division chairman, with A. C. Miller of Gulf Research and Development Corp. as moderator. The symposium will include talks on five key topics by the following speakers:

Space Formulations Up to Date by John Odeneal, Fairfield Chemicals Division, Food Machinery & Chemical Corp.

Residual Formulations Up to Date by J. E. Bussart, Velsicol Chemical Corp.

House & Garden Insecticides Up to Date by Eugene Mace, S. C. Johnson & Son, Inc.

New Mechanical Method of Aerosol Application by Alfred H. Yeomans U. S. Dept. of Agriculture, Pest Chemical Research Branch.

Propellants Up to Date by Robert Peterson, Peterson Filling and Packaging Corp.

Due to the broad interest of the symposium to members of the aerosol division, this program is being scheduled as a joint meeting of both divisions. According to George Barr, chairman, the Aerosol Division will feature four technical papers on its program in addition to its annual aerosol product survey, the "official industry yardstick" by which the growth and development of aerosol products are measured. Speakers and their papers will include

Compatability, with Aluminum, of a Large Number of Chemicals Used in the Aerosol Industry by R. M. Howe, Aluminum Laboratories, Ltd., and F. M. Languedoc, Connecticut Chemicals (Canada) Ltd.

Nitrous Oxide as Propellant for Non-Food Aerosols by John S. Hill and Robert C. Webster, Air Reduction Co.

Stabilization of Alcohol-based Aerosols, by Frank A. Bower, E. I. du Pont de Nemours & Co.

Powder Aerosols by Daniel Geary, Union Carbide Chemicals Co.

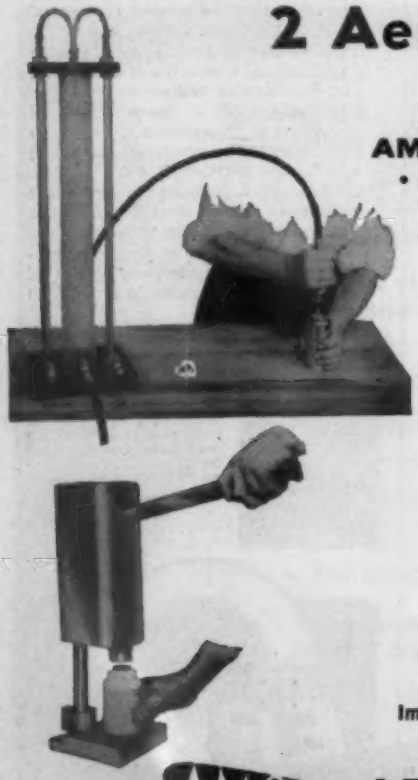
E. E. Husted, Committee Chairman, man, will present the aerosol product survey. As an added attraction market analysts from several companies are expected to make brief forecasts on the future of major aerosol product categories. ★

•

Durazone Adds to Staff

Durazone Sales, Ltd., British aerosol marketer with headquarters in London, has appointed Anthony Hughes to the post of southern divisional sales manager. He joined the company two years ago and had been London and Home Counties field sales manager.

The company also appointed Gordon Grundy, previously Midland area manager, to be northern divisional sales manager.



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- All operating control valves conveniently located at table height on base of Pressure Burette.
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- 1000 cc capacity.
- Compact . . . total height is 30".
- Calibrated in 5 cc graduations.
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AMCO HAND CRIMPER

- Manually operated, short stroke, and multiplied leverage lessen operator fatigue.
- Single stroke action locates can, seats valve in position, and crimps.
- Keyway guided head keeps crimper jaws centrally aligned for all can heights.
- Completely enclosed for safety . . . no moving parts exposed.
- Light, compact, durable unit weighs 16 lbs.

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AMCO AEROSOL MACHINERY CO.

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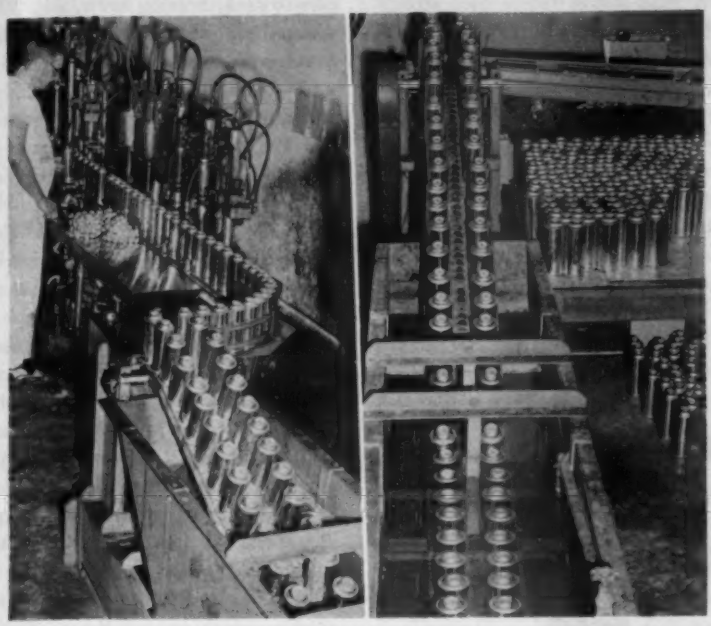
Aerosol Conveyor Lines Use Magnetic Rails to Hold Units



DOUBLE line of aerosol cans ride in and out of the hot water bath at Cincinnati Aerosol Corp. with the aid of unseen magnetic rails. These permanent magnetic rails, made by Eriez Manufacturing Co., Erie, Pa., are mounted directly beneath the non-magnetic, stainless steel belt. The powerful magnetic field steadies the cans as they move through the test tank, where the water is heated to 150° F.

Evolvement of the Eriez "Magna-Rails," is said to supplant several other methods of leak testing hitherto used in the aerosol industry. Early packagers used wire baskets dipped into hot water for container inspection, a method, incidentally, still used for certain pharmaceutical and glass container packages. Another common method of can conveyance involved the use of magnetic slugs embedded along the entire length of a linked chain or wire belt conveyor. This, however, has caused some dissatisfaction because each time the chain is replaced the magnets should also be replaced. Since immersion of the aerosol containers is firmly prescribed in ICC shipping regulations, the aerosol packager has been forced to choose one or the other of these means of testing his containers.

At Cincinnati Aerosol Corp., installation of the magnetic rails in the water bath area has reportedly increased the magnetic strength of the line, and thus facilitated fast, sure handling. In the Cincinnati plant, the double line carries the container at speeds of up to 20 feet per minute. No guide rails are needed and the line may be inclined steeply to shorten belt lines.

•

Owens-Illinois Raises Prices

Owens-Illinois Glass Co., Toledo, O., has announced the first general increase in its glass container prices since 1957. Ray H. Mulford, executive vice-president in charge of glass container operations of Owens-Illinois, said none of the increases apply to shipments made prior to April 1.

"We make this increase reluctantly, but our costs have risen so sharply during the last four years that we have no alternative," Mr. Mulford said. "By April 1, labor costs alone, the largest single factor in glass container production, will have risen by approximately 60 cents an hour, including base rates, fringe benefits, and incentive pay, since Jan. 1, 1957. Transportation rates and other costs have also gone up."

Schrader Valves

(*From Page 27*)

niques to control spring tensions (through selection of materials, wire size, spring diameter, pitch, and free length). In short, Schrader, using this considerable body of experience, indicates it is in aerosols to stay.

An examination of the reasons behind a concentration of design effort on the toggle-action valve typifies the Schrader approach to the valve business. To provide good sealing early push-button valves used strong closure springs and required relatively heavy finger pressure to actuate. Later designs effected a compromise between heavy springs and positive sealing to reduce the finger pressure necessary to actuate. In the toggle-(or tilt) action valve, as perfected by Schrader, stronger spring tension can be used to insure perfect sealing, while lever advantages within the valve permit extremely light actuating pressure.

The toggle-action valve also goes far toward solving two problems which have bothered designers and consumers since the first aerosol was sold—"mis-fires" due to the finger of the user slipping off the button, and the frequent unexpectedness of spray direction. The toggle-action valve actuator button has an inclined non-skid surface that all but eliminates misfires and almost insures dispensing in the right direction.

The Schrader management knows much research and many problems lie ahead. By improving components, through the use of new materials and improved production techniques, the company is preparing for the design versatility that will be increasingly demanded in the future. Currently, for instance, the search is on by Schrader chemists for a rubber-like plastic, which has all the properties required in specific valve parts—chemical inertness, self-lubrication, stress-crack resistance, flexibility, and controlled compressibility. Among the company's other long-range research projects are the elimination of the rubber gasket and development of a springless valve, a development which could remove the last possibility of dissimilar metal corrosion.

These are just a few of the projects with which Schrader hopes to improve its competitive position in the aerosol valve business.★

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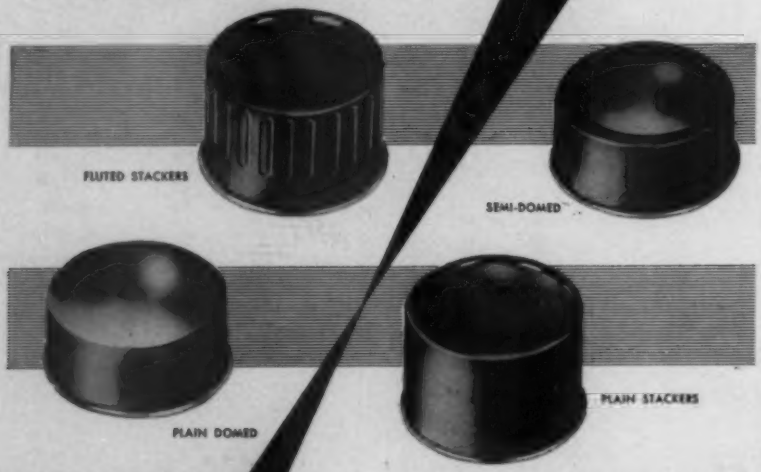
SUPERIOR SERVICE
for the
AEROSOL INDUSTRY



We also manufacture tin plate Screw Caps from 18mm to 120mm.

PENN, known for finest service to the bottling industry for over 25 years, is now making tops for aerosol containers.

All of Penn's customers receive superior service and careful attention on every order. You are assured of top quality workmanship, the right price and immediate delivery.

Call or write for information.

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•

D & O Unveils New Quarters

Dodge & Olcott, Inc., New York, celebrated its recent move to new quarters with a March 1 cocktail party and housewarming for the press and members of the industry. The laboratories were open for inspection and guests invited to tour through the various departments. One highlight of the tour was the official unveiling of Dodge & Olcott's gleaming new aerosol laboratory, headed by Vincent DeFeo.

Approximately 100 guests attended the party, as did the entire D & O national sales staff, which was in town for the occasion. A piano player pounded out honky-tonk tunes during the festivities.

FTC Warns on Label Terms

"Simultaneous and industry-wide voluntary compliance" with the cosmetic industry trade practice rule forbidding misleading use of foreign terms on labels or in advertising has been requested by June 30 by the Federal Trade Commission. Special letters went out last month from the FTC's Division of Trade Practice Conferences to 40 producers or compounders of perfumes and other cosmetics. The letters, signed by E. M. Hall, Jr., attorney in the division, imply that legal action by the FTC will follow failure to join the voluntary effort.

Recipients of the letter were asked to notify the FTC by March 20 whether they would cooperate with the effort, and to forward specimens of proposed revised labeling showing the wording of the disclosure that the products are not of foreign origin by April 20.

Latest FTC activities in this area stem from a new interpretation of Rule 3 (of the Cosmetic Industry Practice Rules), which prohibits labeling or advertising with names, words, or phrases implying foreign origin if the products are composed in part of domestic and in part of imported ingredients unless the foreign origin representations are accompanied by a statement setting forth clearly the fact that the products were "made, compounded, diluted, mixed, blended, or assembled, in the U. S." The FTC has interpreted this rule to mean that such a disclosure must appear prominently on the front of the package.

•

Pennsalt Moves Research

Pennsalt Chemicals Corporation has announced the transfer of its Sales Technical Service groups to new and expanded laboratory facilities at 900 First Avenue, King of Prussia, Pa. These groups were previously located at Pennsalt's Whitemarsh Research Laboratories, Wyndmoor, Pa. and at Devon, Pa.

The new building, a two-story, 31,000 square foot customer service laboratory, is the first unit to be completed in the company's planned $6 million Technical Center. This Center will be located on a 50-acre site in King of Prussia Industrial Park.

The move centralizes all groups providing technical customer services for "Isotron" refrigerants and aerosol propellants; rubber chemicals; and other specialty products.

Compatibility

(*From Page* 56)

brane, aerosol preparations present toxicological problems of inhalation. Particles of 3 microns or less easily reach the alveoli of the lungs, those from 3 to 10 microns reach the parenchyma of the lungs only with considerable difficulty, and those over 10 microns will hardly penetrate the lung tissue. However, as is now well known, the size of the particles depends on the aerosol system, the propellant mixture, and the valve. Therefore it would follow that new aerosol preparations should not only be submitted to inhalation tests, but to toxicological examination from other standpoints.

Following are shown a few test possibilities for products to be applied externally. Quevauviller and coworkers[13] recently proved the good skin compatibility of rats to the various chlorofluormethanes. Propellants 11 and 12, by itself, in a mixture, and in oily solution, were applied three times daily for two months, with no alteration of the skin.

A substance causing a reaction at first contact with the skin may be defined as a primary skin irritant. If the skin is able to cope with the irritant, the reaction is physiological. However, if the nature of the attack exceeds the normal defensive capability of the skin, the reaction is a pathological one and will result in irritation. This type of irritation may be tested by means of the technique of applying small rags on the depilated, intact, and mechanically injured skin of the rabbit.

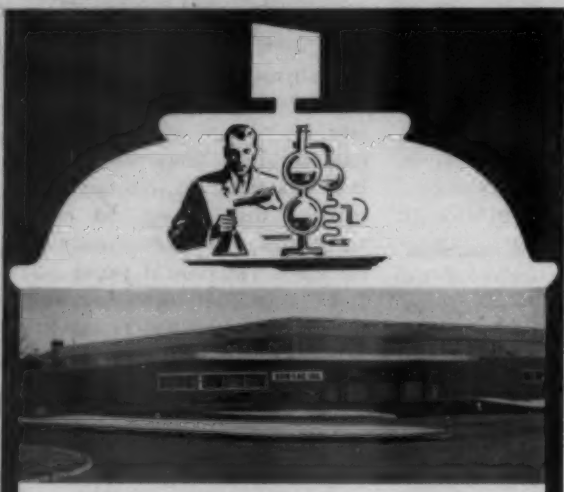
judge 'em by the rejects.

Is aerosol quality control adequate?

Generally speaking, we at Western Filling think it is. In so far as custom fillers are concerned, you will not find one without some sort of control program and most are fairly good. Suppliers of chemicals and parts likewise are control conscious. That some companies are better than others cannot be denied.

We feel that emphasis must be placed on receiving inspection, ingredient composition, weight control and finished product evaluation. The amount of money that Western Filling spends on quality control is pretty high—but the amount spent on reject materials (finished goods) is comparatively low. The net result is overall savings accompanied by the most valuable asset a firm can have—customer respect and loyalty. We do our utmost to earn this respect and loyalty which we feel is the most valuable of all assets.

You've probably heard of us. Western Filling. We're at 6423 Bandini Blvd., Los Angeles 22, Calif. Phone No. is RA 3-9177. We solve problems and we're real friendly.



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From product packaging to distribution, Sun-Lac's entire operation is geared to help you go places in the ever increasing aerosol market.

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Skin sensitization is a phenomenon revealing itself by local effects on the skin or mucous membranes. It differs from primary irritation in that it does not occur at first contact, but must be induced by repeated contact. It may also affect tissue far removed from the place of application, and the number of contacts necessary to initiate the reaction may vary considerably. It depends mainly on the sensitization potential of the substance as well as that of the individual.

In order to detect strong sensitizers, the intracutaneous technique has proven best on guinea pigs. To that end an intracutaneous injection (of a solution of the substance to be tested) is given every other day over a certain period of time, up to a total of 10 injections completed two weeks after the first one. The skin reaction visible 24 hours later, in relation to the reaction to the first injection, should serve as a criterion for the sensitization.

Naturally, this test, like all animal tests, will have to be modified in accordance with the product to be tested. Skin irritation and sensitization tests are also done on humans, however the rag test on rabbits and the intracutaneous test on guinea pigs should always precede any human testing. When developing new products, a large series of animal tests is a valuable method of ascertaining detrimental individual components and combinations.

In order to investigate primary irritation of mucous membranes, we use in animals the vagina (preferably of dogs), the penis, and the conjunctive sac of the eye. For the eye test mainly rabbits are used.

In order to ascertain possible injury to internal organs as a result of skin penetrations, the products should be applied to major regions of the test animal's skin. This should be done one or several times daily over periods of up to 90 days. At the same time these tests will give the opportunity to study the skin compatibility of the product over a long period of time. During the entire period of these tests the general behavior, weight, and quantity of food consumed daily are examined, and urine and blood are tested. Those animals which succumb during the tests or suffer from serious effects of poisoning are given complete pathological and histopathological examination of the vital organs. Such experiments yield most valuable data regarding the reaction of a product in permanent daily use.★

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Science of Valves

(*From Page* 39)

product viscosity. The larger the inside diameter, the less the cavitation. The smaller, the greater the cavitation.

The main object of this discussion of the possible variations of the valve components is to alert the valve customer to one all-important point. The total number of variations is so great it is a practical impossibility to make each of these combinations available when assisting in the development of a new aerosol product. However, if the customer cooperates in providing product data for questions put to him by the valve manufacturer, *the de-*

More manufacturers specify Action Plastics because: we are the only manufacturer who produce our own compounds; use virgin materials exclusively; have a unique, fully automated manufacturing process; maintain continuous quality control; have superior stress-crack resistance. Action Plastics Dip Tubing is available in varying diameters, wall thicknesses and formulations in polyethylene, linear polyethylene and rigid and flexible vinyl compounds, as well as in polypropylene and nylon. A laboratory report is furnished with each shipment.

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model 1000-m, including: gasser, filler, crimper, pressure tester, support rack and shelf $397.50
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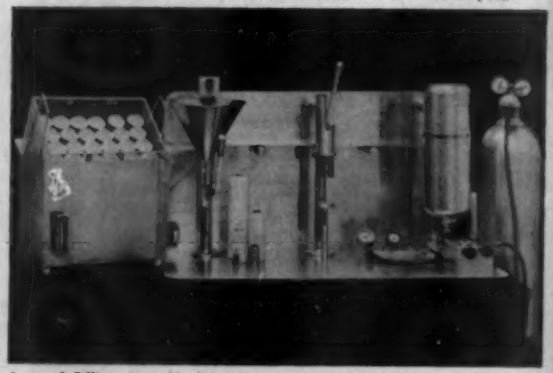

Aerosol Filling Unit Model 1000-M with leak test tank & accessories

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Bottle Crimper	$189.50	Can Crimper (manual)	$159.50
Nitrogen Regulator	47.00	Agitator	34.50
Leak Test Tank (stainless steel)	179.50	Nitrogen Connecting Hose	4.50
Scale	22.50	Valve Adapters (specify)	4.00
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velopment time could conceiveably be cut in half.

In addition to product quality, probably the most valuable asset the valve supplier has to offer the customer is experience gained through many years of manufacturing valves for a myriad of product types. To achieve maximum efficiency, the most nearly ideal valve must be chosen from a whole series of possible combinations. The knowlege about which components are best suited for the product is the province of the valve manufacturer, and this knowledge is of most value to the customer when an act exchange of information (between supplier and customer) exists.★

Marketer's Role

(*From Page 24*)

nomical. By switching to the .013 low spray rate body valve which deliver 0.5 gm./second, this same container then would last three times as long.

Physicians now wanted a smaller container so that the patient with limited skin irritation would not self prescribe. Using approximately half the contents of our large package and receiving excellent effects, he might give the remaining medication to a relative or friend who had what he thought was a similar problem and might inadvertently cause some difficulty to this individual. By developing a smaller package this could then be eliminated. Which container should we use? Tin, glass, stainless steel, aluminum? The standard tin can manufacturers do not make any containers smaller than three ounces. Glass does not appear similar to the original package. Stainless steel is not an economical container unless it is definitely required for stability. We found that there were no stability problems with aluminum and this new smaller package looks like a small replica of the larger unit. Simultaneously, we then adopted the vapor tap for application of our preparation both in an upright and in an inverted position for ease of application by the consumer.

On the development of this smaller container, we encountered a problem of dip tube growth, resulting in the end of the tube sealing off at the bottom of the flat container. The standard three-ounce can, with the convex bottom, did not have this problem as the dip tube grew toward the corner and could not seal off.

In our original development work, the valve supplier recommended the length of tubing required, and on a Saturday morning we filled approximately 3,000 cans. The following Monday, approximately 75% would not spray!

With the aid of the valve supplier and our own Pharmacology Department, we took X-ray pictures of the dip tubes in finished containers, and determined that two inches of polyethylene dip tube will grow about ⅛ inch in the presence of Propellant 11. It was then an easy matter to establish specifications. We would have saved quite a bit of time if the suppliers had made us aware of this growth problem.

It is interesting to note that many patients felt the cooling effect of this aerosol was beneficial to the irritation but by the same token, there were some complaints on cooling due to evaporation of propellant. As a result, in May we introduced a new package containing a metered dose of an aerosol foam, which gives the consumer an economical dose where one shot can cover an area of approximately nine square inches. There were many problems in the development of this package, such as valve specifications, molding of the outer case and filling problems.

We have an incoming inspection by Quality Control Department to check the components at a 1.5% A. Q.L. level based on the MIL statistical sample program and run the following tests on valve components:

A. *Shelf Life Tests*

Samples of cans are filled, weighed and stored under various temperature conditions and re-weighed peri-

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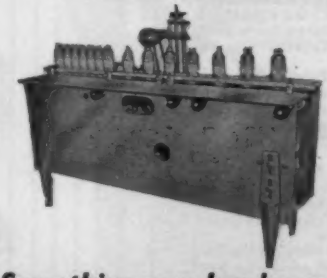

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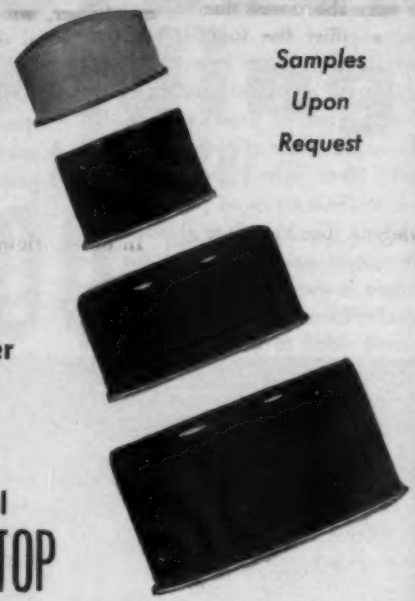

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odically to determine the loss. These results are then checked statistically to determine if the requirements are satisfactory.

B. *Use Life*

Containers are filled, sprayed and weighed, stored at room temperature for 24 hours, re-weighed, sprayed, weighed, stored for 24 hours and re-weighed. This is continued for six successive days. The loss in weight between use is calculated to determine when 10% of the propellant has leaked out, therefore making the package unacceptable.

C. *Spray Rate*

Finished packages are weighed and activated for three 3-second shots and the average amount of spray rate is determined to see that the valve is within the specifications for this component.

D. *Valve Flaws*

A sample group of containers is filled and put in a hot water bath at 130°F to determine what percentage of leakers can be expected from the valve on the container.

E. *Stability Studies*

All products under study are put up at room temperature, 37°C, and 45°C for various periods of time, observed to check for any discoloration or corrosion. Also the contents are checked chemically to determine if either the active ingredient or any other part of the formulation is affected. If any trouble is noted at higher temperatures, this does not necessarily mean that we can expect this difficulty at room temperature but does tell us that we have to be careful and this indicates that room temperature studies should be followed more closely.

How can we all benefit from the growth of pharmaceutical aerosols?

1. Fillers should first decide *if* they want to enter the field. This will involve additional expenses, since the filler interested in pharmaceuticals should set up a special isolated area for either drugs or food, and separate it from the filling of insecticides, hair sprays, etc. Adequate quality control and product development sections should be made available to aid the pharmaceutical houses in the development of new drug forms. We all know that any business concern will work with a supplier who works with them. *It is too late to get the business for a product that has already made good on the market. When the filler has worked with the pharmaceutical houses on their development, it is generally conceded to be that filler's project.*

2. Valve manufacturers will have to spend more money on the development of valves for new applications—accurate metering for both the fluorinated hydrocarbons and the nitrogen propellants. The FDA does not accept the average of 10 shots, because the patient does not get the *average* of 10 shots, but only *one shot at a time.* Accurate metering valves will lead to possible applications for aerosols in injections, particularly in the veterinary field, in inhalation therapy and also treatment of mastititus in cattle.

3. Container manufacturers will have to consider smaller and smaller sizes, as most pharmaceuticals are packaged in containers of three ounces or smaller.

4. New plastics will have to be developed to compete economically with tin, aluminum, etc.

5. Closure manufacturers will have to work toward an economical plastic pilfer-proof closure.

If these points are considered, everybody can benefit from a growing business.★

Aerosol Dosages

(*From Page* 23)

on bandages and acne medications. These products and others are available either as liquid or powder sprays or foams.

Propellant 114 alone or in nonflammable azeotropic mixture with ethyl chloride is applied as an aerosol in the skin-planning procedures used

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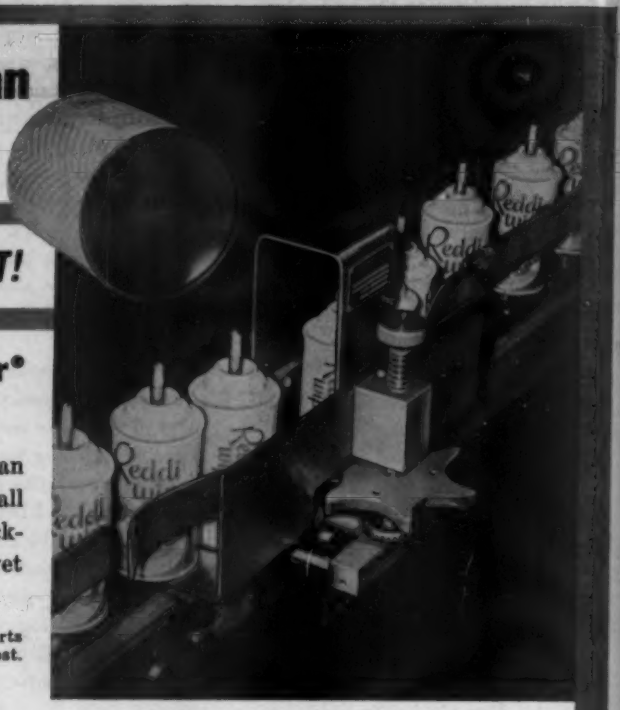

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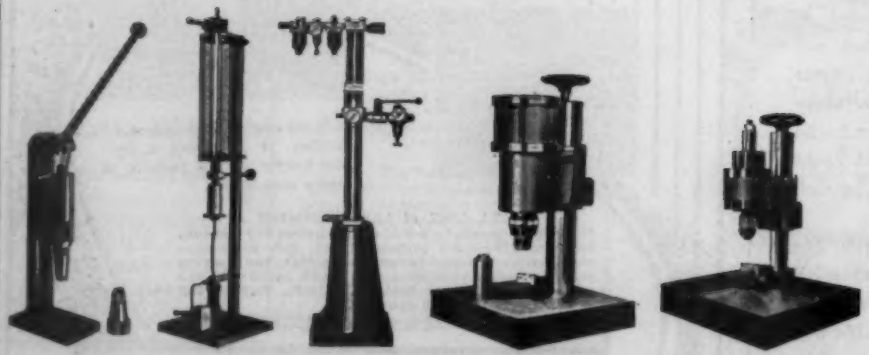

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Sales Representative:

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to remove or reduce facial scars. The product both anesthetizes and hardens the skin to prepare it for planing by the wire brush.

Inhalation aerosols promise to become an important class of aerosol pharmaceuticals for administration of systemic medication. The aerosol unit possesses several outstanding advantages over atomizers, nebulizers and similar devices: It provides uniform dosage via the metering valve, and constant and more uniform particle size. It is less bulky and can easily be carried in the pocket. It does not require cleaning. Its small size makes it possible to use during daily activities without causing embarrassment to the patient. Stability and sterility of the product are maintained.

Inasmuch as speed of response to drugs administered via the lungs can approach that of the parenteral route, the injection procedure can be replaced by the inhalation aerosol in the case of many drugs. The inhalation route is superior in several aspects:

1. Destruction of drug in the gastrointestinal tract, as occurs with orally administered drugs, is avoided.
2. A drug ordinarily given by injection by a physician or nurse can be administered by the patient.
3. The need for aseptic procedures associated with injections is obviated.
4. The pain and fear that are inseparable from the injection procedure are eliminated.
5. The hazards of injection (trauma, embolism and sterile abscesses) are avoided.

At least four inhalation type aerosols products are now being marketed. They are:

1. Epinephrine for relief of asthma,, bronchiectasis and emphysema.
2. Isoproterenal for asthma therapy.
3. Octyl nitrite for angina pectoris.
4. Ergotamine tartrate for relief of migraine syndromes.

Numerous other drugs are being considered for incorporation into aerosol inhalation dosage forms. Among these can be listed antihistaminics, antibiotics, antinauseant drugs, sterols and steroids, antitussive agents, hormones, cardiotonic drugs and diuretics. The formulation of these products will not be simple, but any successes gained will be well worth the effort expended.

Intranasal therapy deserves brief mention as an aerosol dosage form. Aerosol nasal decongestants are being marketed and are superior to nose drops or squeeze-bottle preparations. The advantages are: small and uniform particle size, ease of administration, metered and uniform dosage, and maintenance of stability and sterility of product.

Aerosol vaginal therapy surpasses suppositories, douches and ointments or creams in several ways:

1. Aerosol administration of medication is easier and more convenient than douching.
2. Aerosol foams can be formulated in a variety of viscosities and can be designed to slowly build-up after instillation. As opposed to conventional ointments, creams, and jellies, the expansion of the aerosol foam brings about more efficient filling of all portions of the vaginal tract, and thus enhances therapeutic action of the medication.
3. As mentioned in connection with previously described products, the stability and sterility of the product is protected.

Aerosol vaginal therapy can be applied to treatment of infection or simply for routine hygiene. It could be used also to apply drugs for absorption from the vaginal tract in order to obtain a systemic effect.

The pharmaceutical aerosol suggests intriguing possibilities to anyone concerned with the development or sales of drug products. Although many advances have been made in

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aerosol technology since its inception approximately 15 years ago, there is still much to be done. However, the aerosol chemist must depend very heavily on his own ingenuity and resources because scientific literature and reference material concerned with aerosols is still very sparse. This is particularly true in the pharmaceutical field. Great gaps still exist in our knowledge and the universities of our nation can do much to fill these gaps.★

Minneapolis Survey

(*From Page* 20)

the two year period. The strength of the aerosol as a packaging type is further evidenced by the purchasing pattern in country vs. city dwellers, where aerosols accounted for substantially the same number of purchasers.

BECAUSE there was no package breakdown for auto polishes and window cleaners, the aerosol products are mixed in with—and in some cases part of—the brand answers. For instance, Windex was the leading glass cleaner, but no provision was made for determining how much of this market went to that marketer's pressurized product. Something similar happened for the three leading marketers of auto polish, all of whom have an aerosol product as part of their regular brand line.

To no one's surprise, Colgate led the toothpaste field, with more than twice the percentage of its nearest rival. However, this figure was not as impressive as answers to a further question on type of container for toothpaste purchased. The pressurized can finished well behind the tube with a 6.9 percentage.

The survey was conducted by independent paid interviewers who asked the homemakers not sure of their brands to show them what brands they actually had on hand. In order to provide separate data on Hennepin County homes without unnecessarily enlarging the sample, an unbalanced sample design was employed in which 600 interviews were made in the county alone and 600 elsewhere in the state.

In Minneapolis and St. Paul, largest cities in the state, a form of probability was employed. This specified the census tracts, blocks, and "nth" households in which the interviews were to be obtained. Interviewers did not identify themselves as with the *Minneapolis Star and Tribune*, but rather, as representatives of "Metropolitan Surveys."

Copies of the complete survey are available from William A. Cordingley, national advertising manager, *Minneapolis Star and Tribune*, Minneapolis 15, Minn. ★

Herzka-Pickthall

(*From Page* 48)

the back of the book.

Also, recent rapid advances in pharmaceuticals and foods, increased use of liquefied petroleum propellants, the changing patent situation on use of polyvinyl pyrrolidone in hair sprays, are all developments which naturally could not be discussed in the book. But these, after all, are small complaints when weighed against the worth of the book itself.

Before moving on, one might mention one additional small complaint. Possibly the well-versed aerosol technician would have wished for more pithy chapters on a whole variety of subjects. In nearly every case ("Laboratory Evaluation" being a notable exception) the chapters tend to perhaps skim over some areas of discussion which could well stand extensive amplification. But this too is a not too serious shortcoming when one is reminded that the book covers so very much important ground in its 509 pages.

The chapter which impressed this reviewer most was Chapter 19 "The General Formulary." In this lengthy 20-page offering are included one (and in some cases several) formulation(s) for aerosol adhesives, anti-foam sprays, anti-static sprays, car odors, car polish, charcoal lighter, general purpose cleaner, cold cream, degreaser de-icer, dog repellent, dog shampoo, dry cleaner, fruit ripener, furniture polish, ignition dryer, ignition waterproofer, lens cleaner, lubricating oil, mildew preventive, mold release spray, nail dryer, nail polish remover, oven cleaner, powder spray, rug cleaner, rust pre-

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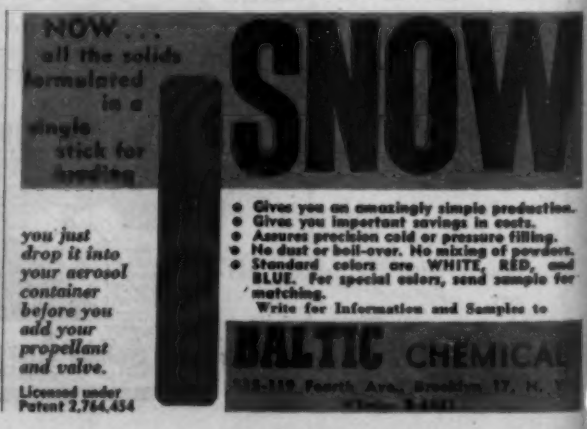
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ventive, shoe polish, silver polish, suede dressing, tire cleaner, water repellent, and window cleaner. Since the editors of this magazine are constantly asked for such formulations, this chapter should prove to be of special value here and also in the laboratory of the filler and marketer.

Because of the special value of the more than 200 formulations, the good general discussion of a wide variety of subjects, the superb glossary, the trade listing, and the excellent illustrations and text (in "Pressurized Packaging (Aerosols)," this reviewer would hate to have to choose between the Herzka-Pickthall book and the Shepherd book. Instead, the best advice for the person either deeply involved in the aerosol industry or remotely interested in getting into it might be that these volumes belong side-by-side on his bookshelf.—DAD

To Write Labels

(*From Page* 30)

tionary measure can be omitted in such cases. The problem will be how to write a regulation in general terms which will still require the precautionary measure in cases where it is necessary, where it must be required. I mean in cases where it is *not* clearly implied in the statement of hazard. Perhaps such a regulation will have to enumerate specific statements of hazard which adequately imply the precautionary measures to be taken.

The law requires *First Aid Instructions* "when necessary or appropriate." Quite often they are obvious and well known, once the user reads the statement of hazard on the label. The practice today is to include them on the label wherever the product is "highly toxic" and is therefore labeled "Poison," and wherever the hazard is eye injury, since prompt flushing of the eye with water is almost always most important and should be continued longer than the ordinary person realizes. Here again it may eventually be possible for the Administration after it has acquired a broad knowledge of household products and their hazards to write a general regulation which can serve as a general guide. Notice that the law does not use the word "antidote."

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This is because doctors in government and in industry are agreed that antidotes are rare things; that even for "highly toxic" products (poisons) first aid is generally all that can be done. Of course, where there is a known antidote, and the hazard is serious enough to require First Aid instructions on the label, the antidote must be named.

Storage instructions mean, of course, storage instructions which will reduce the hazard of personal injury. Instructions which do not relate to such a hazard obviously do not belong in this part of the label. Storage instructions which relate to the preservation of the product or of its quality should be put elsewhere on the label.

As is well known, this statute, with its criminal penalties, grew out of injuries to children. I think the record shows that this was the principal reason why Congress felt that civil liability alone was not a sufficient deterrent to insufficient labeling or, if Voltaire's phrase is preferred, was not "a sufficient encouragement to warn." And that is why the statute specifically requires that whenever a product is sufficiently hazardous to require any kind of a warning, you must add the statement "*Keep out of reach of children*" or its equivalent. Some may well feel that any warning clearly implies this. I think FDA has the power to waive the requirement or to permit a sensible modification where it is consistent with the Congressional intent to do so. There are, of course, products which are hazardous enough to require warnings but which at the same time are safe enough for children to use and which, in fact, are commonly used by children.

The statute also requires that the marketer state the *names of the hazardous ingredients*. This means the ingredient or ingredients which substantially contribute to the hazards of the product. This is perhaps more than the common law rule of civil liability requires today, but it is certainly not many years in advance of that rule, as it is developing. The sole purpose of the requirement as stated in the legislative history of the new statute is to do what can be done to give the doctor immediate information in an emergency. The history shows that Congress was thinking about telling him quickly what chemicals he is up against, when a child has swallowed them and he is called in or the parents have him on the telephone. The thought is that, in time, the doctor will learn that this information is on the label and that in any event perhaps he or the parents will look at the label in the hope of learning what it is the child has swallowed.

I think it will be found that the Food and Drug Administration will insist that the chemical be described specifically enough for that purpose, but at the same time will not demand that the description be more specific than a doctor would consider useful, or so specific that it will tell him nothing. In some cases a class name may be more useful to him than the full structural name of the specific molecule. Of course, if there is any doubt about the adequacy of the description, it will be resolved *against* the marketer.

The Administration has the power, in my opinion, to waive the requirement entirely, and where the name of the chemical is of no emergency use to the doctor, it is reasonable to ask the FDA to do so. Thus if the only hazard is flammability or explosiveness, this is surely so. Perhaps it is so also in the case of irritants and sensitizers.

Where they are important for emergency use, the Names of the Hazardous Ingredients should, of course, appear as part of the warning, where they can readily be found.

I want now to discuss, as examples, two or three specific products and their hazards, and their warning labels.

WHITEWALL TIRE CLEANER
WARNING!

Spray may cause eye injury.
Do not get in eyes.
In case of contact, flush eyes with plenty of water for 15 minutes.
Get medical attention. Contains caustic (3%).
Keep out of reach of children.

This we assume for the purpose of

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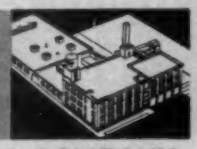

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this talk to be a liquid cleaner, packaged in a metal can with a pump spray top, composed of a caustic (less than 3%), isopropanol (less than 10%), glycol ethers (perhaps 10%) and water. The oral LD_{50} to rats is 40 gm/kg. Is it a hazardous substance? Is there a reasonably foreseeable hazard of substantial personal injury? The doctors and the lawyers and even the salesmen say "Yes," to the eye; since (1) it contains the caustic, and (2) it is a liquid sold for use as a spray. Thus the labeling.

Signal Word: "WARNING." (The caustic is only 3% or less, and the product is not a poison, even under the now repealed Caustic Poisons Act. At some level of caustic content, the possible injury will be so severe that the Food and Drug Administration may well require POISON on the label of a product under the new statute; but surely not at this level.)

Statement of Hazard: "*Spray may cause eye injury.*" (Note the emphasis on the spray, in view of the pump spray top to the container. If this were a paste, or perhaps if it were used as a liquid, the doctors would not consider it hazardous.)

Precautionary Measure: "*Do not get in eyes.*"

First Aid: "*In case of contact, flush eyes with plenty of water for* 15 *minutes. Get medical attention.*"

Name of Hazardous Ingredient: "*Contents caustic* (3%)." (The doctors say that a more specific description of the particular caustic is not needed. The percentage is given, although not required by the law, as further information important for the doctor to know.)

Storage Instructions: (None relevant to the hazard of personal injury.)

Statutory Statement: "*Keep out of reach of children.*"

WARNING!
COOLING SYSTEM CLEANER
Contents or solution may be fatal if swallowed.
Causes eye injury and skin irritation.
Avoid contact with skin, eyes or clothing.
Do not take internally.
Avoid breathing dust.
Keep away from children.

POISON
Contains Oxalic Acid
First Aid Treatment. If swallowed make patient vomit immediately (finger down throat or give warm mustard water or salt water freely). If available give 1 ounce calcium lactate in glass of water or give a glass of lime water. Call a physician.

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This is the warning on a present label for such a product. It was designed to comply with the Federal Caustic Poison Act. Although that Act is repealed and supplanted by the new statute we are discussing, it seems clear that the new law requires substantially the same wording, except for the word POISON. The Food and Drug Administration may well require POISON (and DANGER) on a 90% concentration such as this. In any event, from the point of view of civil liability, it would seem unwise to drop POISON. Some rearrangement of the wording to follow the pattern of the new law is desirable.

AUTOMOBILE SPRAY AROMA
WARNING!
Contents under pressure.
Do not puncture.
Expose to prolonged sunlight or other source of heat may cause bursting.
Do not throw into fire or incinerator.
Do not let children handle.

For the purpose of this talk, we assume this product is an aerosol, and is said to give old cars that new car odor. It consists solely of perfumes and scents, which carry no hazard, and a propellant, which we assume is a typical non-flammable fluorocarbon. The only hazard is the hazard of explosion, inherent in all aerosols. The warning is that most recently developed by the Aerosol Division and the Precautionary Labeling Committee. It is an attempt to make the several earlier versions more curt and direct. It is an example of a label which is believed to comply with the common law rule and the new statute, to include all of the requirements of the new statute, although the arrangement varies from the order in which they are set forth in the statute and although the label relies in some degree on the "clear implication" doctrine. Thus part of the precautionary measure is clearly implied by the statement of hazard; part of the statement of hazard is clearly implied by the precautionary measures; and storage instructions are clearly implied by both. Taking these implications into account, we have, in effect:

Signal Word—"WARNING"
Statement of Hazard—"Contents under Pressure. Puncturing, or exposure to prolonged sunlight or other source of heat may cause bursting." (The reference to prolonged sunlight seemed desirable because it is reasonably foreseeable that the user may not think of sunlight as a source of substantial heat.)
Precautionary Measure—"Do not puncture except to prolonged sun light or other source of heat, or throw into fire or incinerator." (The reference to fire or incinerator seememd desirable for emphasis; the disposal of an "empty" container being regarded as a principal hazard.)
First Aid (None relevant)
Storage Instructions—"Do not store in sunlight or near other sources of heat."
Statutory Statement—"Do Not Let Children Handle". (This modification of the statutory phrase seemed more emphatic and direct.)

In closing, it may be useful to mention two legal points which the marketer may want to bring to the attention of his lawyer. He will undoubtedly receive numerous requests from your customers for written guarantees that his products are labeled in accordance with the statute. The law includes a provision which relieves them of criminal liability under the statute, if they have such a guarantee from the marketer and are simply reselling his products in the original containers bearing your labels. Does the marketer's lawyer feel that the giving of such a guarantee will increase his civil liability to his customer? I presently doubt it. Suppose a product is seized by the Food and Drug Administration for violation of the Act after it has been sold and it is in the customer's warehouse or store? Suppose a user is injured and sues the customer for failure to warn and the customer turns to the marketer?

The other point is this. As you may know, violation of a criminal statute such as this is generally admissible as evidence of negligence in a civil suit for damages. In some states it creates a presumption of negligence. Suppose an injured person sues the marketer in negligence for failure to warn, or to warn adequately, under the common law rule. He offers proof of a violation of this statute as evidence of negligence. In the opinion of the marketer's lawyer, can a plaintiff prove a statutory violation with less evidence than he would be required to offer anyway in order to prove negligence? Does the statute affect liability in civil suits? I presently doubt that it does so substantially. ★

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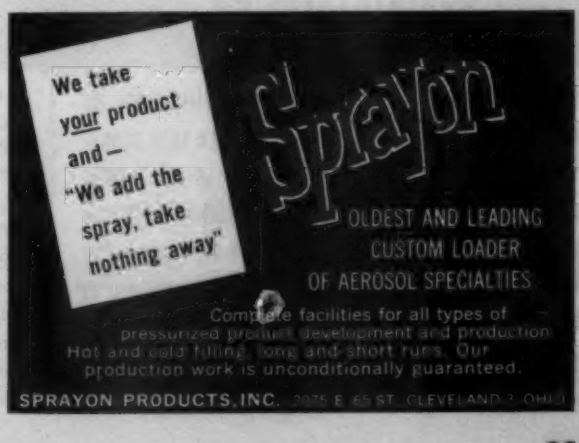
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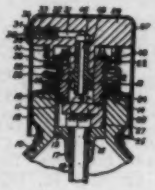
New Aerosol Patents

Listed below is a brief review of recent patents pertinent to the aerosol and related industries.

Complete copies of these patents may be obtained by writing to the Commissioner of Patents, U. S. Patent Office, Washington 25, D. C., and remitting 25 cents for each copy desired.

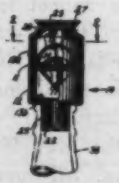
2,973,123. FLUID DISPENSING MEANS. Issued Feb. 28 to Rene Paul Rousset, Middlesex, England, assignor to Sparklets, Ltd.



A dispensing device for controlling the discharge of a fluid under pressure comprising a cylindrical member, a resilient sealing member, means for holding said resilient sealing member in sealing contact with an end of said cylindrical member, an actuating member slidable in said cylindrical member and having walls defining a passage therein through which discharge can occur, and an annular sealing skirt carried by said actuating member and making resilient contact with the inner wall of said cylindrical member, said actuating member having an end adapted to be pressed on said resilient sealing member to break the seal between it and said end of said cylindrical member.

•

2,970,722. PRESSURE SEAL FOR PRESSURE LIQUID CONTAINER. Issued Feb 7 to Jordan S. Levenson, Los Angeles, Calif., assignor of one-tenth part to Gadget-Of-The-Month Club, Inc., North Hollywood, Calif.



A pressure seal for pressurized liquid containers, comprising, in combination, a main body portion having an outlet at one end and an inlet at the opposite end provided with engaging means adapted to be removably sealingly engaged with a container for pressurized liquid, valve means intermediate the opposite ends of said main body portion controlling the passage of pressurized liquid therethrough, a removable closure cap carried by said outlet end of said main body portion, said valve means comprising an integral partition wall effectively transversely dividing the interior of said main body portion into a pair of separate compartments, one of said pair of separate compartments comprising an outlet compartment associated with said outlet and the other one of said pair of separate compartments comprising an inlet compartment associated with said partition wall defining a central opening, and a bulbous partially spheroidal hollow valve member having effective average density less than the density of pressurized liquid adapted to be carried in a container removably engaged with said engaging means, said bulbous partially spheroidal hollow valve member releasably engaging and closing said central opening and extending substantially into said inlet compartment, a bridge supported within said outlet compartment and extending over said central opening longitudinally spaced from the partially spheroidal portion of said bulbous hollow valve member, and a tension spring connected between said bridge and said bulbous hollow valve member extending through said central opening, said bulbous hollow valve member being floatable upon a quantity of liquid within said inlet compartment into a position out of closing engagement with said central opening in response to rotation of said main body portion out of its normal vertical orientation into a tipped position having a substantial transverse directional component.

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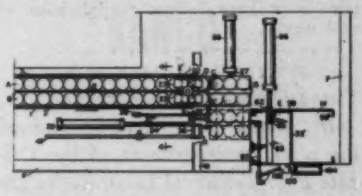
2,973,040. FIRE EXTINGUISHER. Issued Feb. 28 to Kenneth B. Covert, Marinette, Wis., assignor to Safe, Inc., Marinette, Wis.

A package comprising a pressure-type container having a valve-controlled opening charged with a fire-extinguishing dry powder and a gaseous propellant confined in the container under the vapor pressure of the propellant, the powder being sodium bicarbonate and the propellant being dichlorodifluoromethane in a amount from 2½% to about 5% of the powder by weight.

•

2,972,842. CAN PACKAGING METHOD AND MACHINE. Issued Feb. 28 to Eugene B. Hitchcock, Box 51, Longwood, Fla.

In a machine for loading a plurality of objects into a carton, an object receiving station, means feeding objects to said station, an object carrier proportioned to receive a predetermined number of said objects, means to position said carrier at said station to receive objects from said feeding means, a carton loading station spaced from said receiving station, control means for said positioning means, said positioning means being responsive to operation of said control means to transport said carrier from said receiv-



ing station to said loading station, ram means comprising a moveable portion including an impact head at said loading station and also comprising means for driving said head forwardly into said carrier at said loading station to eject the objects from said carrier and for rearwardly retracting said head out of said carrier, said control means being responsive to filling of said carrier with said predetermined number of objects and concurrent retraction of said head to actuate said positioning means to transport said carrier from said receiving station to said loading station, a control element operatively engaged by said carrier upon reaching said loading station, said element being connected to said ram means and effective upon said engagement by said carrier to control said ram means to move said moveable portion forwardly thereby to force said head into said carrier, and means coupled to said moveable portion of said ram means and operated by said forward movement of said portion connected controllingly to said control element and effective upon reaching of a predetermined position of advance of said ram head to actuate said head, said first control means comprising object engageable presence sensing means engageable by an object at said carton loading station operative upon ejection of the objects from said carrier by said forward travel of said head to actuate said carrier transporting means to return said carrier to said object receiving station.

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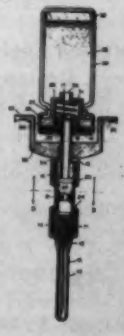
2,971,509. DISPOSABLE HYPODERMIC SYRINGE. Issued Feb. 14 to Milton Joseph Cohen, 5437 Connecticut Ave., N. W., Washington, D. C.



A disposable hypodermic syringe comprising a container for medicament and fluid and having an open end and an at-

taching flange thereabout, a hollow needle and a connection between said container and said hollow needle including a tube, valve means for controlling the discharge through said tube and said needle, and a finger grip on said tube so that such finger grip may be engaged while the thumb is pressed against the end of said container to operate said valve, said tube having a compressible portion for aspiration to indicate improper application of said needle.

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Turse Joins Colgate Research

Dr. Richard S. Turse has joined the research department of the Colgate Pharmaceutical Laboratories Division of the Colgate-Palmolive Co., New York. He was formerly with Rutgers University, where he recently received his doctoral degree in analytical chemistry. He obtained his B.S. degree in pharmacy and his M.S. degree in pharmaceutical chemistry from the Rutgers College of Pharmacy.

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Trade Mark Applications

Applications for registration of the following trademarks were published in recent issues of the *Official Gazette* of the U. S. Patent Office. In not all cases are there strictly aerosol trademarks, however, many of the products listed below come within the category of those for which a possible future use in aerosols is foreseen.

SPRAGRIP, for liquid belt dressing. Filed Nov. 9, 1959 by A. W. Chesterton Co., d.b.a. Chesterton Mechanical Packings, Everett, Mass., giving first use Aug. 15, 1952.

3-ALARM, for preparation for the treatment of burns, sunburn, scalds, contact dermatitits, and other skin irritations. Filed Aug. 31 by Dubblarr Labs, Inc., St. Simons Island, Ga., reporting first use May 17.

ROULITE, for hair colorings and other preparations. Filed July 28 by Roux Laboratories, Inc., New York, claiming first use Sept. 21, 1940.

PERMA-SILK, for solid lubricant composition in pressurized containers for spray application on surfaces of metal, wood, plastic and the like to provide dry film lubrication thereon. Filed Sept. 19 by Everlube Corp. of America, d.b.a. Everlube Corp., North Hollywood, Calif., with first use given as March, 1960.

EXTERN, for topical skin medication. Filed Nov. 15 by Colgate-Palmolive Co., New York, with first use reported as Oct. 11.

CRAFT MASTER, for decorative enamels in the form of a kit for hobby or household use. Filed May 2 by Palmer-Pann Corp., Toledo, with first use claimed for Oct. 21, 1959.

EXOTOL, for preparation for the removal of ear wax. Filed Sept. 2, by Blair Laboratories, Inc., New York, giving first use as July 26.

HEAL-O-RED, for antiseptic surgical ointment. Filed Sept 9 by Berlin C. Garrison, d.b.a. Heal-O-Products Co., Phoenix, Ariz., claiming first use Aug. 12.

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POLYTAR, for pharmaceutical preparation—namely, ointment for the treatment of skin diseases. Filed July 13 by Stiefel Laboratories, Inc., Oak Hill, N. Y., reporting first use May 10.

COMMANDO, for insect repellent. Filed July 8 by M.F.A. Oil Co., Columbia, Mo., giving first use as June 15.

HEP, for oven cleaner spray. Filed July 8 by B. T. Babbitt, Inc., New York, reporting first use in March 1955.

THIO-KIL, for active chemical ingredient incorporated in a combination insecticide, fungicide, and miticide product. Filed Dec. 14, 1959 by Shulton, Inc., Clifton, N. J., claiming first use Oct. 15 of same year.

BOWL-BATH, for cleaning composition for toilets. Filed March 28, 1960 by American-Marietta Co., Chicago, reporting first use on or about Feb 17 of same year.

TINETTE, for hair tints, hair dyes, and color shampoos. Filed Nov. 25, 1959 by Caryl Richards, Inc., New York, with first use claimed for Aug. 10, 1959.

ETROLENE, for veterinary drugs and animal health products for control of a wide variety of pests in and on animals, especially livestock. Filed Nov. 7 by Dow Chemical Co., Midland, Mich., with first use reported as Sept. 30.

HISTA-VADRIN, for upper respiratory decongestant. Filed Oct. 27 by First Texas Pharmaceuticals, Inc., Dallas, Tex., giving first use as July 12.

MELITTIS, ORMENIS, and LYCOPSIS, all three for liquid perfume bases to be used in the manufacture of perfumes, colognes, cosmetics, and soaps. Filed March 21, 1958 by Givaudan-Delawanna, Inc., New York, claiming first use, respectively, Aug. 25, 1926; Dec. 22, 1936; and Nov. 4, 1926.

•

CSC Buys 4 Vitamin Firms

Commercial Solvents Corp., New York, last month announced the acquisition of four companies which produce and market stabilized vitamins for the animal feed products industry. The firms purchased are Stabilized Vitamins, Inc., Vitaron Chemical Manufacturing Co., and Astrol Products, all of Garfield, N. J., and the Iowa Nutrition Co., Clinton, Iowa. All four were purchased from their founder, Adolph Rosenberg, and his family.

•

Dr. Walter Dove is Dead

Dr. Walter E. Dove, retired director of entomological research for the Fairfield Chemical Division of Food Machinery & Chemical Corp., New York, died March 22 at Millersville, Md. There were no details available at press time, but a full account will appear next issue.

CLASSIFIED ADVERTISING

Address all classified replies to Box Number c/o *Aerosol Age*, PO Box 31, Caldwell, N. J. Rates for "Help Wanted" advertisements are 20¢ per word; minimum charge $3.00. Rate for individuals seeking employment is 5¢ per word, $1.00 minimum. Advertisements of new machinery, products and services accepted at the rate of $10.00 per column inch. Minimum space, one inch. Copy closing date, 10th of preceding month. *Checks must accompany all orders.*

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AEROSOL CHEMIST: M.S. degree, partial Ph.D., age 40, 8 years' experience in aerosols and chemical specialties. Instrumentation including gas chromatography, polarography, spectroscopy. Familiar with aerosol valves, sealants, plastics, rubber. Proven ability in setting-up, equipping, running modern aerosol laboratory. Location: Eastern U.S. Salary open. Address Box 245, c/o Aerosol Age.

HELP WANTED:

PRODUCTION SUPERVISOR for aerosol plant. Must have broad experience with all phases of aerosol production for well-established company, expanding factilities, New York City area. Partnership or other arrangements. Write Box 246, c/o Aerosol Age.

WANTED TO BUY:

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Grocer's Liability Changed

In a move that could have consequences for marketers of aerosol products, the New York Court of Appeals last month ruled that a grocer is liable for injuries to the family of a shopper to whom he sells harmful food. Until the March 2 decision, the state's courts had maintained that a seller was responsible only to the individual to whom he made the actual sale. This was based on the theory that the storekeeper had a theoretical contract of sale with only the shopper and thus did not furnish a warranty to persons not a party to the contract.

Chief Judge Charles S. Desmond, who wrote the majority opinion, declared that "when so much of our food is bought in packages today, it is not just or sensible to confine the warranty's protection to the individual buyer. At least as to food and household goods, the presumption should be that the purchase was made for all the members of the household." The particular case involved a can of salmon (bought from a neighborhood market) which contained pieces of sharp metal and injured the buyer's daughter.

Island Marks 20th Anniversary at Miami Luncheon

Island Equipment Corp., Miami, Fla. manufacturer of conveyors and unscramblers for the aerosol and other industries, recently celebrated the 20th anniversary of its founding with a special luncheon at the San Regis Restaurant, North Miami. In addition to executives of the company, distributors, and agents from all over the country attended the celebration. These included Mr. and Mrs. William Stokes and Peter Tegner, of Stokes Equipment Co., Philadelphia; Lee Whitney, of L. A. Whitney Co., Needham, Mass.; George Sundin, Lyttleton Packaging Machinery Co., Houston; Fred Fauth, American Bottlers Equipment Co., Baltimore; E. Brigante, Lake Industrial Products Co., Chagrin Falls, O.; Austin Basner, Lawrence Barton & Co., New York; and Edward Stiles and Roger Morceau, Stilers Conveyors & Transmissions, Inc., Miami.

In an address at the luncheon, J. W. Stiles, president and founder, traced the history of the company. He reported that one of the early orders, a complete conveying system for the India Brewing Co., Mayaguex, Puerto Rico, had to be shipped three times because the first two units were on ships sunk by German submarines in the Caribbean.

Publicity Agency Moves

Norman Odell Associates, Inc., public relations agency for the Chemical Specialties Manufacturers Association Aerosol Publicity Campaign, has moved its offices to 205 East 42nd Street, New York 17, New York. Henceforth the company will be a division of de Garmo, Inc., New York advertising agency. Telephone number of the Odell organization is MUrray Hill 4-7430.

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Announce Status of 'Freon C318'

The date for action of the Food and Drug Administration to allow the use of "Freon C-318" as a food additive has been advanced to May 3, an announcement from the "Freon" Products Division of E. I. du Pont de Nemours & Co., Wilmington 98, Del., said early last month. DuPont will sell the propellant directly to food aerosol manufacturers and the Ohio Chemical & Surgical Equipment Co., a Division of Air Reduction Co., Madison, Wis., will market mixtures of "Freon C-318" and nitrous oxide.

The FDA has told DuPont that final action on the propellant may be made before the May 3 date, and in anticipation of this DuPont has accumulated a sizable stock of the material to provide for the launching of new products.

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Spray Prods. Names Saunders Co.

J. Paul Saunders Co., Bowling Green, Ky., has been named sales representative for Spray Products Corp., Camden, N. J. for the states of Kentucky, Tennessee, Mississippi, and Alabama.

TGA Convention in New York

The 26th annual convention of the Toilet Goods Association will be held at the Waldorf-Astoria Hotel in New York May 9-11, with the Toilet Goods Industry Golf Tournament slated for May 8 at Winged Foot Golf Club, Mamaroneck, N. Y. The association will hold its business sessions on May 9 and 10. The Scientific Session will be held on May 11.
May 11.

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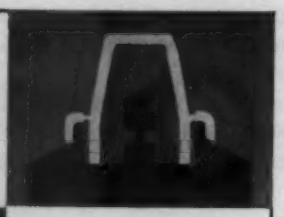
Breech to Rexall Board

Ernest R. Breech, formerly board chairman of the Ford Motor Co. and currently one of its directors, has been elected to the board of directors of the Rexall Drug & Chemical Co.

Next Month . . .

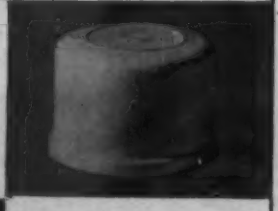
Commencing in the May issue of *Aerosol Age* will be a series of articles (written by the research personnel of Air Reduction Co., Madison, Wis.) describing what is termed a "revolutionary" breakthrough in the field of compressed gas propellants for non-food aerosols. The use of nitrous oxide, carbon dioxide, and nitrogen in such non-food aerosols as insecticides, furniture polishes, automotive products, and other specialty aerosol products will be discussed in detail. And revealed for the first time will be a method developed by Air Reduction to accomplish high-speed filling of this type of aerosol *without* gassing and shaking.—*The Editor.*

Plastic aerosol caps



Tamper-proof caps sitting inside or outside

Cover caps
55 x 40 mm
32 x 24 mm



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Lüdenscheid / Westf.
— Germany —

The May Issue of Aerosol Age Will Be Distributed at the Chicago CSMA Convention

Make your advertising reservations now for this important issue, which will be distributed to the industry leaders attending the Chemical Specialties Manufacturers Association Convention at the Drake Hotel in Chicago, May 15-17.

Special editorial features will tie in with the convention—and your advertising will benefit from the extra circulation and interest which this big issue will enjoy.

Regular advertising rates will apply—Get your advertising reservation in before the April 12 closing date.

AEROSOL AGE

P. O. Box 31 Caldwell, N. J.

Phone: CApital 6-5520

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Plan New Plastic Bottle Plant

Owens-Illinois Glass Co., Toledo, last month announced that a new plant for the manufacture of blown plastic bottles is being built in Jersey City, N. J. Construction of the 160,000 square-foot plant and warehouse has already begun and start of production has been set for next summer.

The plant will be the sixth plastic bottle plant since it introduced the high density polyethylene bottle three years ago. Others are in Kansas City, Los Angeles, Chicago, Cincinnati, and Toronto.

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Davies to Get SCC Award

Dr. J. T. Davies, professor and head of the Department of Chemical Engineering at the University of Birmingham (England), will receive the 1961 Special Award of the Society of Cosmetic Chemists and its prize of $1,000. The award will be presented during the Society's Semi-Annual Meeting to be held May 12 at the Hotel Biltmore, N. Y., in recognition of Dr. Davies' work in the field of surface chemistry.

Dr. Davies received the M.A. and CANTAB. degrees from the University of Cambridge and his D.Sc. degree from the University of London and was associated with the Department of Chemical Engineering of the former school before joining the faculty of the University of Birmingham. His work has included studies of olfactory thresholds; the interfacial viscosity of mono-layers; and of quantitative kinetic theories of emulsion type.

CIBS Award to W-L Chemists

Robert E. Ring, president of the Cosmetic Industry Buyers' and Suppliers' Association (CIBS), has announced the annual C.I.B.S. Award will go to Dr. Martin M. Rieger, director of cosmetic development, and Dr. Stanley Brechner, senior chemist, both of Warner-Lambert Pharmaceutical Co. The award, presented to the authors of the most meritorious paper delivered at the Scientific Section of the TGA during the calendar year 1960, is entitled, "Studies on the Adsorption of a Simple Dyestuff by Hair"; Mr. Ring will present the award to the authors at the Scientific Section Luncheon of the TGA on May 11.

Spray Patterns

PROVIDING enough representatives from the U.S. aerosol industry are interested, The Federation of European Aerosol Associations will be able to make arrangements with Thos. Cook & Sons, world-renowned travel bureau, for excursion rates to Zurich to attend the third annual International Aerosol Congress there Oct. 3-6. Very wisely, we think, the dates for the meeting were chosen at a time when the tourist rush will have subsided, and lower air fares will be in effect.

Also, the CSMA is currently investigating the possibility of assembling a plane tour made up of U. S. aerosol executives and researchers. Those interested should contact the CSMA office in New York.

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As this issue goes to press, word comes from the FEA office that booth space is still available for the International Aerosol Exhibition (Oct. 4-8) which will be held in conjunction with the International Aerosol Congress. U. S. and other foreign firms looking to sell their components or machinery in Europe would do well to inquire about booth arrangements by writing directly to the FEA office, 2 Waisenhausstrasse, Zurich 1, Switzerland.

If the Food and Drug Administration finds nothing else about which to request further data, "Freon C318" (Octafluorocyclobutane), DuPont's new food propellant, may win full approval by the time this appears in print.

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Two pharmaceutical people well known to the aerosol industry have just recently switched jobs. Fred Pickerell, purchasing agent for Schering and head of the Aerosol Committee of the Packaging Institute, has joined Rexall Drug Co. as packaging director. Carl Stearns, one of the administrators of Lederle's aerosol packaging, is now sales representative to the pharmaceutical industry for Emson Research. More on these next month.

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A new aerosol marketer, Beecham Products, Inc., Clifton, N. J. was in the news last month. Marketer of the new piston package for "Brylcream" (see "New Products" section, page 36), Beecham is one of the sponsors of the television program "The Untouchables," which is in trouble with the New York State Italian-American community because of its portrayals of gangsters of Italian extraction. Representative Alfred Santangelo (D., N. Y.) has strongly advocated that Italian-American groups boycott the products of Liggett & Myers Tobacco Co., chief sponsor of the program, and has also mentioned the possibility of similar action against Beecham and American Home Products. Beecham was also mentioned in the newspaper obituaries of Sir Thomas Beecham, world renowned conductor, who was the son of one of the founders of the British parent company and inherited more than $100 million from his father's interest in the company.

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Although we haven't yet seen mention of it in the U.S. press, *The London Sunday Dispatch* (Feb 19) reports that President Kennedy's personal physician has pioneered a new aerosol treatment for relieving the pains of lumbago and slipped discs. The paper says that Dr. Maurice Ellis, of the Leeds General Infirmary (London) has found that fibrositis, from which President Kennedy has suffered, was "permanently dispelled after one spray treatment." Any of our readers know anything about this?

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Good news for the aerosol industry: A good many economists are saying that the current recession has hit bottom, and many predict that steady gains will be felt beginning sometime in April or May. They point out that inventory reductions, a key factor, has largely ceased and just this factor alone will mean a business upturn. Uncertainty in the consumer market, large-scale unemployment, and short work-weeks are still with us, but these economists suggest the worst of these may be over.

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Predictions of future aerosol production and sales, always good headline stealers in the trade press, were the highlight of an address on aerosols by M. N. Conville, managing director of Aerosol Packaging Co., Ltd., (leading British aerosol filler) made to the Pressure Packaging Discussion Group of the British Institute of Packaging. Mr. Conville predicted that British aerosol production would reach 250 million by 1970, or about five per capita. He based his estimate on U.S. aerosol predictions (made by DuPont that by 1970 U.S. sales would reach 10 per capita) coupled with the sharply rising British sales figures over the past two years.

"You and your damned 'convenience packages'!"